

U. S. Department of the Interior

ANNUAL REPORT ON THE LIMNOLOGY AND WATER
QUALITY MONITORING PROGRAM AT CRATER LAKE
NATIONAL PARK

National Park Service



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QUALITY MONITORING PROGRAM AT CRATER LAKE
NATIONAL PARK


1982

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INTRODUCTION

In 1982, the National Park Service provided funds in the amount of \$30,000 for a limnological monitoring program at Crater Lake National Park. This action was prompted by a study which indicated that Crater Lake had undergone an estimated 25-30 percent reduction in epilimnetic transparency (from surface to 40 meters, approximately) in less than 15 years, as determined by Secchi disk and Kahl photometer (Table 1). The investigator (D. W. Larson, unpublished data) attributed this loss of clarity, tentatively, to an increase in phytoplankton biomass, which is often the cause of reduced Secchi transparency (Wetzel, 1975), and is regarded as a precursor of accelerated eutrophication in oligotrophic lakes (Hasler, 1969).

Initially, the monitoring program was envisioned as having three objectives:

(1) Provide the National Park Service with reliable baseline limnological data for use as a benchmark, or basis for comparison. This would allow future investigators to determine whether the lake had changed, and if so, how and to what extent. Indications that the lake had become less transparent (based primarily on Secchi disk measurements) were questionable because of a meager historical record, consisting of two Secchi readings in 1913, three in 1937, and six in 1968-1969.

(2) Gain a better understanding of the lake's physical, chemical and biological properties, and of how these elements interact to produce the unique limnological character of Crater Lake. This information would assist Crater Lake National Park interpretive staff in responding to visitors' questions about some of the lake's unusual limnological phenomena.

(3) Develop an applied research capability so that cause-effect relationships, with regard to the impacts of park use and management practices on lake quality, might be ascertained. A long-term monitoring record would prove if there was indeed a trend toward lake degradation. This would establish whether a special study, aimed at identifying the cause of degradation, would be needed. This would hasten the time that corrective action might be taken, before the lake was irreversibly damaged.

PROGRAM DEVELOPMENT

In response to documented evidence suggesting optical deterioration of Crater Lake, the National Park Service sponsored a workshop at Oregon State University in January 1982 to examine this information, choose an appropriate course of action to deal with the problem, and generally familiarize the workshop participants with the history of limnological research at the Park. Workshop attendees included NPS personnel from the Pacific Northwest regional office and Crater Lake, limnological and oceanographic specialists from academic institutions and the U.S. Government, and private individuals with Crater Lake research experience.

Following two days of presentations, information exchange, strategy sessions, and debate, the participants concluded that some type of limnological or water quality monitoring was needed at Crater Lake. But there was no agreement on what should be monitored and how often. Nor was there a consensus about the validity of the limnological evidence, particularly the Secchi disk data, which had led some workshop participants to believe that lake quality had diminished since the 1960's. Nevertheless, participants drafted a list of

broad water quality objectives and a preliminary monitoring plan to be implemented by summer 1982.

D. W. Larson, a limnologist with the U.S. Army Corps of Engineers and former VIP (Volunteer-in-the-Park) limnological researcher at Crater Lake National Park, was retained on a part-time basis to advise NPS on the development, implementation and conduct of a limnological/water quality monitoring program.

A second meeting was held at Portland in April 1982 to discuss details of the monitoring program, including personnel and equipment needs, and how the program should be funded, administered, and executed in the field. Agreement was reached on a provisional monitoring schedule, including an estimate of start-up time and a list of essential water quality determinations. D. W. Larson was assigned the additional task of compiling all literature pertaining to limnological and other kinds of aquatic research at Crater Lake. This material was assembled and delivered to the Pacific Northwest Region, NPS during the fall and early winter of 1982.

Mr. Mike Gilmore was subsequently hired by NPS to perform the field and laboratory tasks. As Biological Technician (GS-5), it was his specific responsibility to (1) collect lakewater samples for chemical determinations, (2) obtain temperature and optical measurements in the field, (3) conduct water analyses and filtrations in the laboratory, and (4) maintain the boat and limnological gear. During June and early July, Mr. Gilmore received basic training in the fundamentals of limnology and water analyses from D. W. Larson. Assistance in the field and laboratory was provided by either VIP personnel or seasonal park employees who were untrained and inexperienced in limnological

techniques. Consequently, they required special attention from Mr. Gilmore to insure that their work met procedural standards. Mr. Gilmore's salary was about \$4200 which covered his four-month period of employment (June-September). Roughly the same amount was used to pay salary, per diem and travel costs for D. W. Larson.

The procurement of equipment and supplies got started in May 1982 and continued throughout the summer. The cost of these purchases totalled \$19,053.22 (Appendix I). Approximately 35 percent of this amount (\$7000) was spent on a pontoon boat and a 35 hp outboard motor (Appendix I).

MONITORING PROCEDURES

During June 1982, D. W. Larson met with regional and park personnel at Crater Lake to finalize plans for activating the water quality program. Larson provided a map showing lake sampling stations (Figure 1), and recommended the following set of monitoring procedures:

(1) Chemistry

- (a) Collect water samples once every seven days and analyze for dissolved oxygen (DO), total alkalinity (TA), specific conductance (SC) and pH. Collect a total of 14 samples from seven depths: (surface, 50m, 100m, 150m, 200m, 250m, 300m) at stations 13 and 23 (Figure 1).

- (b) Return samples to the lab as soon as possible and refrigerate. At the lab, determine pH without delay. Do determinations for DO, TA, and SC on the same day of sampling (if time permits), or on the following day. Complete all analyses within 24-36 hours following sample collections.

(2) Biological - chlorophyll

- (a) Collect water samples once every seven days and filter for chlorophyll determinations. Collect a total of 24 two-liter volume samples from 12 depths: (surface, 10m, 20m, 40m, 60m, 80m, 100m, 120m, 140m, 160m, 180m, 200m) at stations 13 and 23 (Figure 1).
- (b) Immediately fix samples with $MgCO_3$ and return to the lab for Millipore-filtration (HA-types, 0.45 micrometer pore diam.). Complete filtering within 24-36 hours following sample collections. Freeze filters for later analyses.

(3) Biological - phytoplankton (ID and counts)

- (a) Collect water samples once every 14 days and store for eventual phytoplankton species identification and enumeration. Collect a total of 24 one-liter volume samples from 12 depths: (surface, 10m, 20m, 40m, 60m, 80m, 100m, 120m, 140m, 160m, 180m, 200m) at stations 13 and 23 (Figure 1).

- (b) Fix samples immediately with Lugol's solution and store in a dark, cool place. Prepare Lugol's solution in accordance with Standard Methods, 14th ed., 1975, pp. 1016. Add ten milliliters of Lugol's solution to 1 liter of sample water.

(4) Physical - thermal and optical measurements

- (a) Record thermal profiles on three separate days over a period of seven days. Record profiles at stations 13 and 23 (Figure 1). Extend profiles from lake surface to a depth of 100m.
- (b) Determine Secchi disk depths on three separate days over a period of seven days. Lower disks (both 8-inch and 40-inch types) at stations 11, 13, 23, 16, 25 (Figure 1) on each of the three recording days.

(5) Possible Routine

Monday - Collect 14 water samples for chemistry at each station.

Temperature profiling

Secchi disk readings

Tuesday - Chemical analyses in lab

Data processing and transfer

Preparations for next sampling run

Wednesday - Collect 24 water samples for chlorophyll
Collect 24 water samples for phytoplankton
Temperature profiling
Secchi disk readings

Thursday - Chlorophyll filtration in lab
Label and store chlorophyll filters
Label and store phytoplankton

Friday - Temperature profiling
Secchi disk readings
Preparations for next sampling run

MONITORING ACTIVITIES DURING SUMMER 1982

Monitoring was initiated on 12 July 1982. This late start resulted from an unusually heavy snowpack, which prevented access to the lake, and delays in the arrival of essential instrumentation and field sampling equipment. The water lab was completely operational on 13 July with the exception of a suitable conductivity meter.

Water samples were collected with 2-1/2 and 4 liter volume Van Dorn PVC messenger-activated bottles (Scott manufacture, Seattle). Bottles were arranged in a vertical profile at discrete depths along a cable, and were closed simultaneously by messengers.

Thermal profiles were measured with a YSI tele-thermistor, Model 43TD. The

temperature probe was limited to a maximum deployment depth of 100 meters.

Analyses for DO, TA and pH were performed as follows:

- (1) DO - Winkler Method, Azide Modification, PAO titrant (Hach chemicals); procedures described in Standard Methods, (APHA, 1975).
- (2) pH - pH meter, Altex (Beckman) Expand - Mate instrument. Instrument calibrated frequently with pH 7.0 and pH 10.0 buffer solutions.
- (3) TA - Total alkalinity determined colorimetrically using 0.018N H₂SO₄ as titrant and brom-cresol green - methyl red as indicator solution; procedures described in Standard Methods, (APHA, 1975).
- (4) SC - Specific conductance measurements were not done during summer 1982 because of the late arrival of instrumentation (YSI conductivity bridge, Model 31). The meter arrived about mid-July, but the probe was not received until late August.

Between 12 July and 7 September 1982, a total of 28 days were spent on the lake collecting, or attempting to collect, water samples and taking temperature and optical measurements. Approximately one-half of these days featured conditions suitable for field activities (i.e., smooth lake surface, clear sky). Poor weather (i.e., overcast, rough lake surface) prevented sample collections and measurements on the remaining 13-14 days. Table 2 provides general information on daily weather conditions.

A Kahl submarine photometer, on loan from the Corps of Engineers, was used by D. W. Larson to measure light transmission and spectral selectivity through the vertical water column (surface to 90 meters). These measurements were made on 16 and 29 July. The vertical attenuation of unfiltered light was similar to attenuation rates measured in 1980 and 1981 (Figure 2).

MONITORING RESULTS FOR 1982

A total of 25 temperature profiles were recorded at stations 13 and 23 (tables 3 and 4, respectively). Highest recorded temperatures occurred in the 0-10 meter stratum on 1 August. Later, this column of warmer water had extended to about 15 meters because of increased solar heating and the downwelling of upper layer water by wind action. Temperatures below 40 meters remained nearly constant throughout the summer (tables 3 and 4). Thermal gradients during 1982 were similar to those recorded during four previous years (Figure 3).

Dissolved oxygen, pH, and total alkalinity profiles were measured on five separate occasions at Station 13, and on two separate occasions at Station 23. This amounted to 49 separate determinations for each parameter (Table 5). 1982 values for DO, pH, and alkalinity were nearly identical to values reported for the same parameters in 1968 and 1969 (Table 6).

A total of 93 one-liter volume water samples were collected and preserved with Lugol's solution (Table 7). These samples were eventually examined by inverted microscope for phytoplankton identifications and enumerations (Appendix III). An additional 126 one-liter volume water samples were collected

(Table 7) and Millipore-filtered for chlorophyll determinations (Appendix IV). No attempt was made here to interpret phytoplankton or chlorophyll data. They are intended to serve as reference information for later investigations and interpretations.

The Secchi disk (8-inch diameter) was employed on 38 separate occasions at five locations on the lake. Readings ranged from 21.9 to 30.7 meters (Table 8). Some readings were the lowest ever recorded at Crater Lake under optimal conditions (Figure 4). Only one reading was taken with the 40-inch diameter disk (Station 13 on 12 July).

DISCUSSION AND RECOMMENDATIONS

Historically, the National Park Service has lacked the in-house capability to independently conduct limnological research at Crater Lake, or to routinely collect basic limnological data, which could indicate trends in lakewater quality that have resulted, possibly, from management and use of the park. Until 1982, this information was provided by academic institutions, other governmental agencies, and individual scientists whose work at Crater Lake consisted typically of short-term research projects directed toward one or perhaps a few specific components of a large, complex freshwater ecosystem. None of this work, however, ever amounted to a program of long-term, systematic limnological monitoring despite the facts that the lake is the focus of attention in the park, and is a unique, pristine, still largely unspoiled environment exposed to man-caused sources of air and water pollution.

In 1982, Congressional legislation was passed (Senate Bill S.1119) which directed the Secretary of the Interior to develop and maintain a functional water quality monitoring program at Crater Lake over the next 10 years. Such a program, described earlier in this report, was put into operation during summer 1982 at a cost of about \$30,000. Yearly funding for program maintenance and material procurement is expected to continue at this level for the duration of the monitoring.

The water quality program at Crater Lake is a modest effort, and is currently in a rudimentary stage of development. Considerable improvements are needed if the National Park Service expects to achieve its lake management objectives. The following recommendations are aimed at correcting some major deficiencies in the program:

(1) The need exists for a computer-based water quality data management system. Eventually, both the monitoring program and special research projects will generate substantial quantities of raw data. This information should not be allowed to simply accumulate on endless pages of tables filed haphazardly in loose-leaf notebooks. Rather, before the data base becomes increasingly less manageable and less accessible to users, the incoming data should be promptly loaded into a computerized system for retrieval, analytical and reporting purposes (see Appendix II for an example of such a system). Additionally, the system should also accommodate other pertinent information about Crater Lake, including the bibliography of earlier limnological research and water quality surveys.

(2) An initial research project, limited in scope, should be launched by summer 1983 to try to identify the cause or source of reported deterioration of Crater Lake's optical transparency. Rather than wait several years for indisputable optical data to conclusively demonstrate that lakewater transparency is decreasing, perhaps it would be judicious to assume that the existing data suggesting a transparency reduction are correct, and that, therefore, timely action to counter this deterioration is called for. If lake degradation is in fact occurring, a delay in counteracting the problem may allow it to intensify and become more difficult to control. Although routine water quality monitoring is well underway at Crater Lake, acquiring a large data base is a necessary, but not sufficient prerequisite for pollution assessment, or for a basic understanding of limnological processes of those external environmental phenomena which cause the quality of the lake to deteriorate. Monitoring per se is not research, but rather is a mechanical process by which data are collected for interpretation and, possibly, a determination of cause-effect relationships.

(3) Research on the optical properties of Crater Lake should include the use of remote sensing techniques to study and interpret available LANDSAT imagery and U-2 photographs. LANDSAT imagery of the lake extends back to the early 1970's, and U-2 photos were taken as early as 1964. These materials could be examined chronologically for variations in surface (or epilimnetic) optical properties, which could result from an increase in algal biomass or the concentration of inorganic particulates. Information from remote sensing might also reveal horizontal variation in spectral quality, which could be caused by algal patchiness, thermal plumes, shoreline erosion, or groundwater intrusions.

Portland District, Corps of Engineers will acquire a multispectral analysis system for remote sensing purposes by spring 1983. This equipment is available for research applications at Crater Lake. The system will provide visual enhancement of U-2 photos or LANDSAT imagery through the use of several "false" color pattern overlays which can readily distinguish areas of fine differences as well as prominent or "hidden" features of interest.

(4) The assistant to Mr. Gilmore should be trained and experienced in limnology, oceanography, fisheries or some other field in aquatic science. The position should be occupied by a professional individual who will share the responsibility of maintaining the water quality program, and whose special expertise (e.g., algal taxonomy, aquatic chemistry) could contribute substantially to the program's success. Field personnel who are either technically unqualified, unmotivated or are incapable of doing the work could detract from the efficiency, effectiveness, and credibility of the program.

The National Park Service should begin to consider the need for a permanent limnologist or aquatic scientist at Crater Lake. This person would eventually assume the duties currently handled by Mr. Gilmore, and would be assisted by a qualified seasonal employee. Conceivably, this person would be hired at the GS-5 or GS-7 level, and would be versatile enough to participate and assist in other natural resource activities in the park. The work schedule for this individual should not be restricted to a standard 40-hour week or an 8-hour day. Instead, the person should be free to engage in research or monitoring tasks which may require unusual working conditions such as 12 to 14-hour days, nighttime field work, and weekends.

(5) The limnology of Crater Lake during the "winter" season (typically September through May) is virtually unknown. The reasons for this, as expressed by D.W. Larson in 1972, are understandable: "Sampling Crater Lake during winter would pose a difficult and hazardous task. The steep caldera walls ascend from 150-610 meters above the lake surface. In places, the walls rise vertically to the crater rim. Access to the lakeshore is along a single precipitous trail that switchbacks for 2 km down the caldera wall and is closed by the Park Service in September. Snowfall (September-June) averages about 14 meters annually. Avalanches are common." In addition, lake surface temperatures during winter are probably near 0°C (total ice cover is rare; the average occurrence is about once every 50 years), and wind action can quickly and unpredictably generate whitecap waves capable of swamping rafts or other small sampling craft positioned in open water perhaps a mile or more from shore. Nevertheless, it is reasonable to expect a limnological monitoring program to operate year-round so that seasonal, or monthly, variations in physical, chemical, and biological properties can be recorded. It would be particularly important at Crater Lake to determine the effects of winter conditions on (a) Secchi transparency readings, (b) thermal and light attenuation gradients, (c) the composition, vertical distribution, and relative abundance of phytoplankton species, and (d) vertical distribution of nutrient compounds. This effort would not only help attain program objectives, but could produce information which might qualify as new discoveries in the field of limnology.

Crater Lake should be visited about once every six weeks during winter. To reach the lake, it may be necessary to lower equipment and personnel down a snow chute which descends the caldera wall. This approach would be hazardous, of course, and considerable time and effort could be spent safely negotiating

the extremely steep incline between the caldera rim and the lake, where towering snowbanks form the shoreline. The preferred means of reaching the lake would be via helicopter or floatplane. There is a strong possibility that a U.S. Army Reserve (aviation unit) helicopter will be available during winter to transport equipment and personnel to Wizard Island. There, a rubber raft could be launched for day-long limnological explorations. If the Army Reserve agrees to participate, and favorable weather occurs, winter airborne sampling trips into the caldera could begin as early as February 1983.

(6) The room now used for a water laboratory at Crater Lake will need to be upgraded to meet minimal laboratory standards. The room is too small, does not have a sink or tapwater, is poorly lighted and improperly ventilated, has only one electrical outlet to accommodate several instrument plug-ins, and lacks safety equipment such as an eye washer or decontamination shower. Furthermore, storage space is limited and the lab bench is actually a table overcrowded with instruments and filtration equipment. A portion of the room also serves as an office for the Park's sanitarian. His laboratory is in an adjoining room, and is used exclusively to test drinking water samples for coliform bacteria MPN (membrane filter technique). That lab space is properly equipped and illuminated, and has facilities and amenities which are not available in the water lab (e.g., eye washer, sink, storage cabinets, and extensive bench-top areas).

The two laboratory rooms should be combined into a single water-testing facility used jointly by water quality personnel and the sanitarian. All water analyses (chemical and bacteriological), biological examinations, bioassays, and sample preparations would be performed in the existing

bacteriological lab. Both parties could have their offices and space for equipment and supply storage in the adjoining room which now serves as the water lab.

(7) The need exists for in situ monitoring equipment to improve the efficiency of data collection on the lake, and to generally enhance the limnological capability of the program. If funds are available, NPS should procure the following instruments:

(a) A transmissometer (in situ turbidity meter) to determine concentrations of suspended particulate matter through the vertical water column. This instrument can be obtained from Montedoro-Whitney under GSA contract. The preferred instrument is the M-W model TMU1B which costs about \$6,200. Cable length is 250 meters.

(b) A fluorometer, with constant flow and recording capability, to measure chlorophyll continuously through the vertical water column. The present method for chlorophyll determinations at Crater Lake (i.e., grab sampling, filtration, extraction, and spectrophotometric analyses) is tedious and inefficient, and is likely to produce an inaccurate vertical profile of chlorophyll concentrations.

Turner Design is one of several fluorometer manufacturers. Their model 10-005 R is priced at \$7,000. An additional \$2,000 would be needed to purchase a recorder (\$1,200) and other accessories (cuvettes, cuvette adapter kit, submersible pump, combined chlorophyll and rhodamine accessory kit).

(c) A Kahl photometer (model 268WA 350) should be procured by NPS to replace the Kahl instrument (also a model 268WA 350) now on loan from the Corps of Engineers. A replacement, with digital recording capability, would cost approximately \$6,800.

(8) Sample filtrations and some analyses (pH, conductivity) could be done in a temporary field lab on Wizard Island. This would greatly reduce the number of sample containers, and the volume of water, which is normally hauled out of the caldera by NPS trail crews. Because this hauling must be done before 3:00 PM, to avoid overtime costs and other inconveniences, sample collections are completed by 2:00 PM so that sufficient time remains to deliver the samples to the trail crew waiting at Cleetwood Cove. If much of the sample water could be processed and tested on Wizard Island, fewer samples would have to go up the trail. These few samples could be collected first and taken leisurely to Cleetwood Cove well before the 3:00 PM deadline. Work to obtain the remaining set of samples could then continue without fear of missing the deadline since those samples would be handled on Wizard Island. This could ease any pressure the monitoring team might feel in completing the required tasks for the day.

Prompt analyses of fresh samples would also minimize or avoid data inaccuracies resulting from chemical changes in samples stored for lengthy periods of time, or subjected to agitation during the trip up the trail. pH, in particular, can be affected by these conditions.

(9) Some means of securing the boat in a fixed position during sampling and gear deployment at each of the lake stations should be provided. Because no

anchoring devices are available, the boat now tends to drift even when a slight breeze produces surface ripples. Stronger winds, which generate waves, cause the boat to drift away from a station more quickly. Consequently, sampling locations are scattered in the vicinity of a station, and drifting causes Van Dorn bottles and instruments to deploy obliquely rather than vertically. Thus, work on the lake is limited to fair-weather, calm, smooth-surface days, only 14 of which occurred during summer 1982 (Table 2). This limitation could tend to bias the data.

There should also be some means of determining precise station locations. Buoys could be used to mark these points, but flotation devices would probably be prohibited by NPS since each would have to be large enough to be seen by monitoring personnel. Without marker buoys, however, it is difficult if not impossible to arrive precisely at the same sampling point each time the stations are visited. Triangulation is an alternative method of fixing station locations, but the method may be imprecise and hence little better than merely "eyeballing" or estimating the location.

(10) Perhaps the most important monitoring task at Crater Lake is the phytoplankton study. There are at least 150 species of phytoplankton in the lake, 20 of which are predominant (D.W. Larson, unpublished data for the period 1978-1981). Changes within this community, with regard to species composition, the relative abundance of individual species, species distribution in the vertical water column, and the total number of phytoplankton, or biomass, could indicate subtle shifts in the limnological quality of the lake. Thus, it is imperative that this work be continued, and that the analyses be conducted by an algologist or phytoplankton taxonomist,

preferably one who is familiar with phytoplankton assemblages in Crater Lake and in other high Cascade lakes in Oregon. Ideally, for the sake of continuity, this individual should be retained for duration of the study. This data is needed to help design the research project under recommendation 2.

(11) Nutrient analyses for ammonia, nitrate, phosphate, and silicate need to be initiated. One possible cause for the decreased water clarity is enhanced phytoplankton production made possible by increased nutrient availability. Almost no nutrient analyses have been performed to date on Crater Lake water. Monitoring of nutrient concentrations in 1983 needs to be initiated.

PEER REVIEW

We have established a peer review committee consisting of prominent limnologists and oceanographers from the Pacific Northwest and California. The purpose of this committee is to evaluate the limnological and water quality monitoring program at Crater Lake National Park. The peer review committee will provide recommendations to insure that this program is adequately staffed and equipped, and that correct, state-of-the-art field and laboratory procedures are employed. The committee will also assess the accuracy and the precision of collected data, and the scientific validity and thoroughness of data interpretations.

The peer review committee met for the first time, in February 1983, at Oregon State University, Corvallis. Members received copies of this 1982 Annual Report and were asked to comment on it (Appendix V). The qualifications and expertise of peer review committee members are given for reference in Appendix VI.

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- Wetzel, R.G. 1975. *Limnology*. W.B. Saunders Co., Philadelphia. 743p.

FIGURES

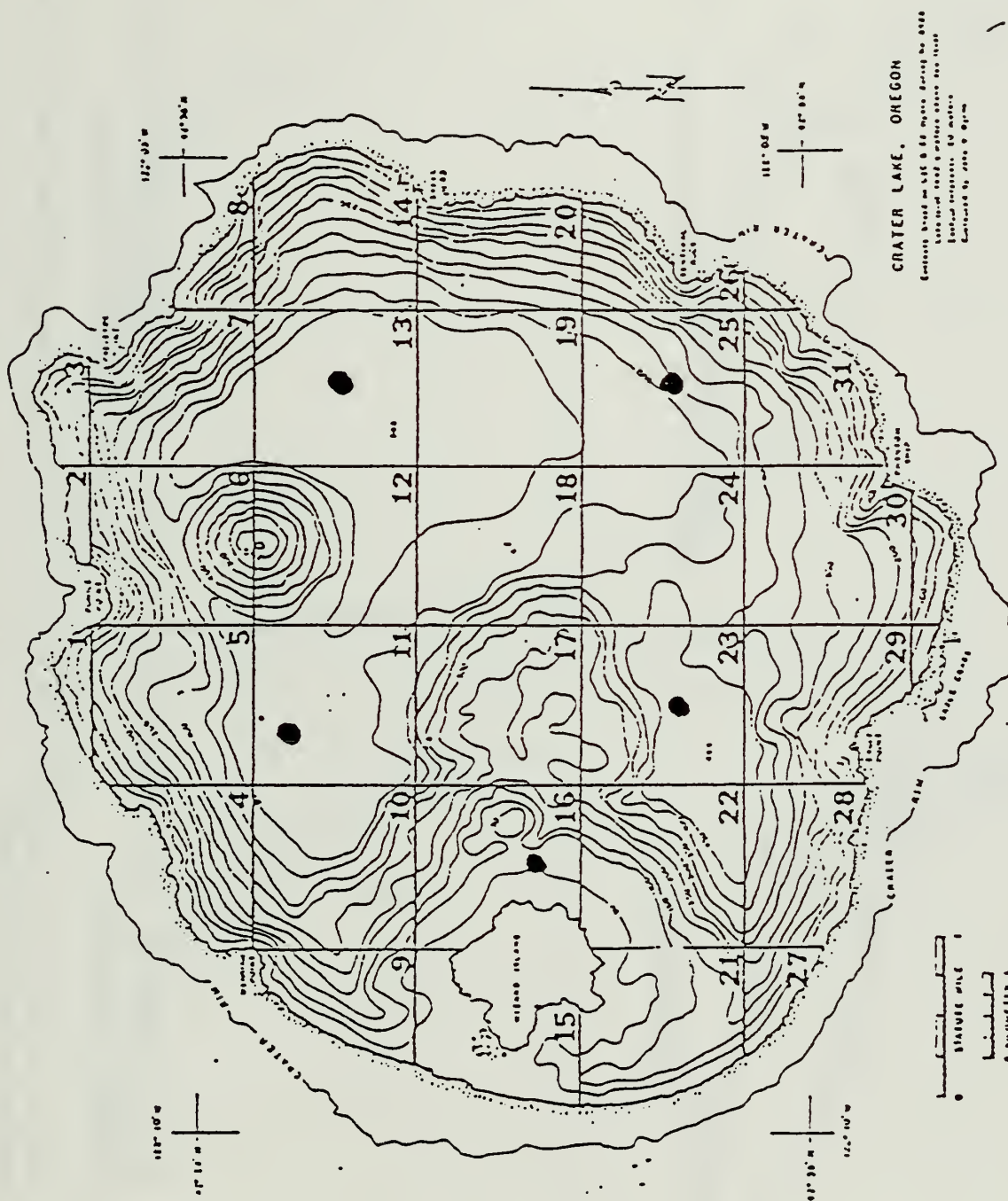


Figure 1. Lakewater sampling locations at stations 11, 13, 16, 23, and 25.

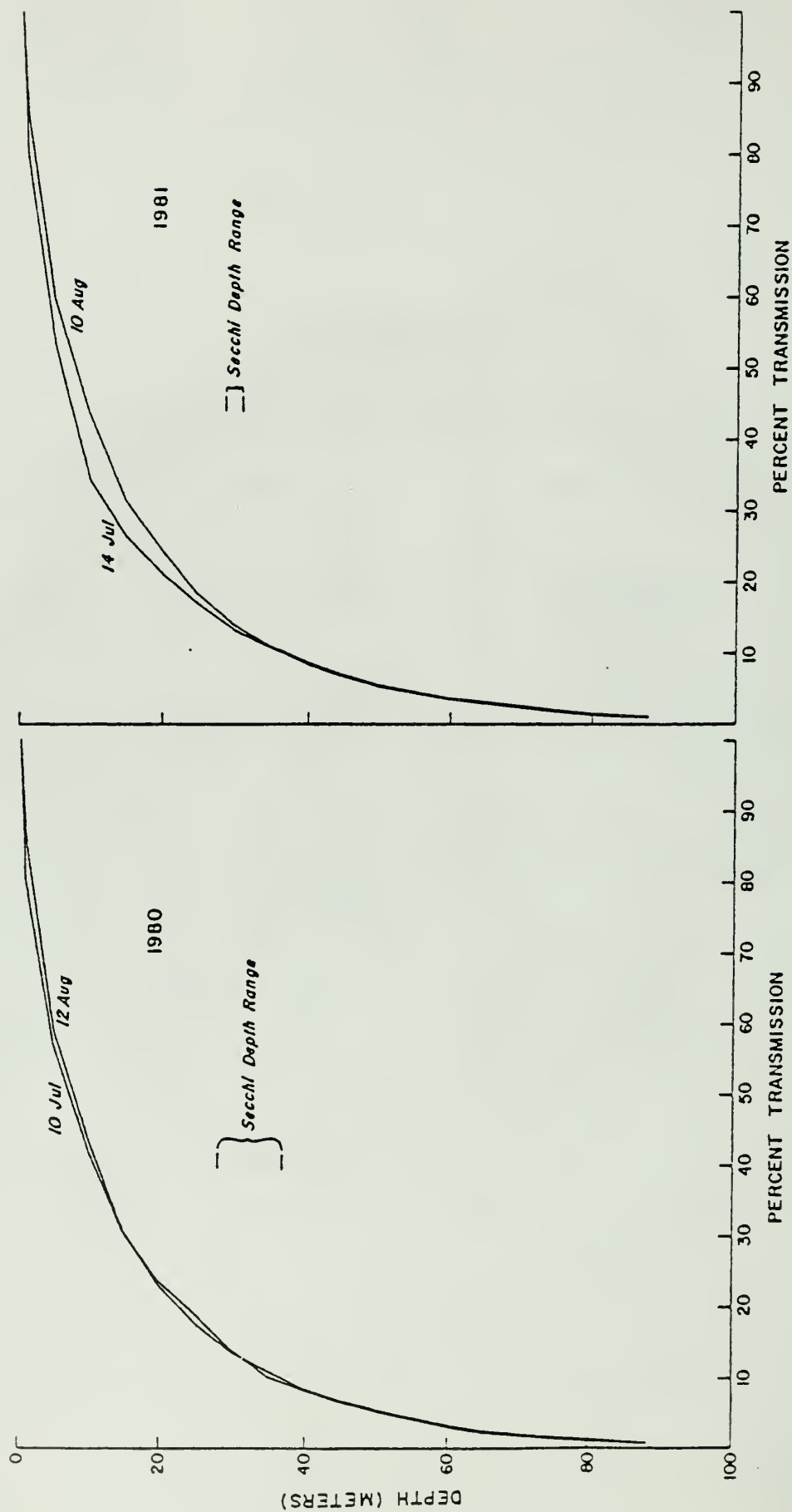


Figure 2. Photometer and Secchi disk readings for 1980 and 1981, Crater Lake, Profiles show the attenuation of unfiltered light with depth.

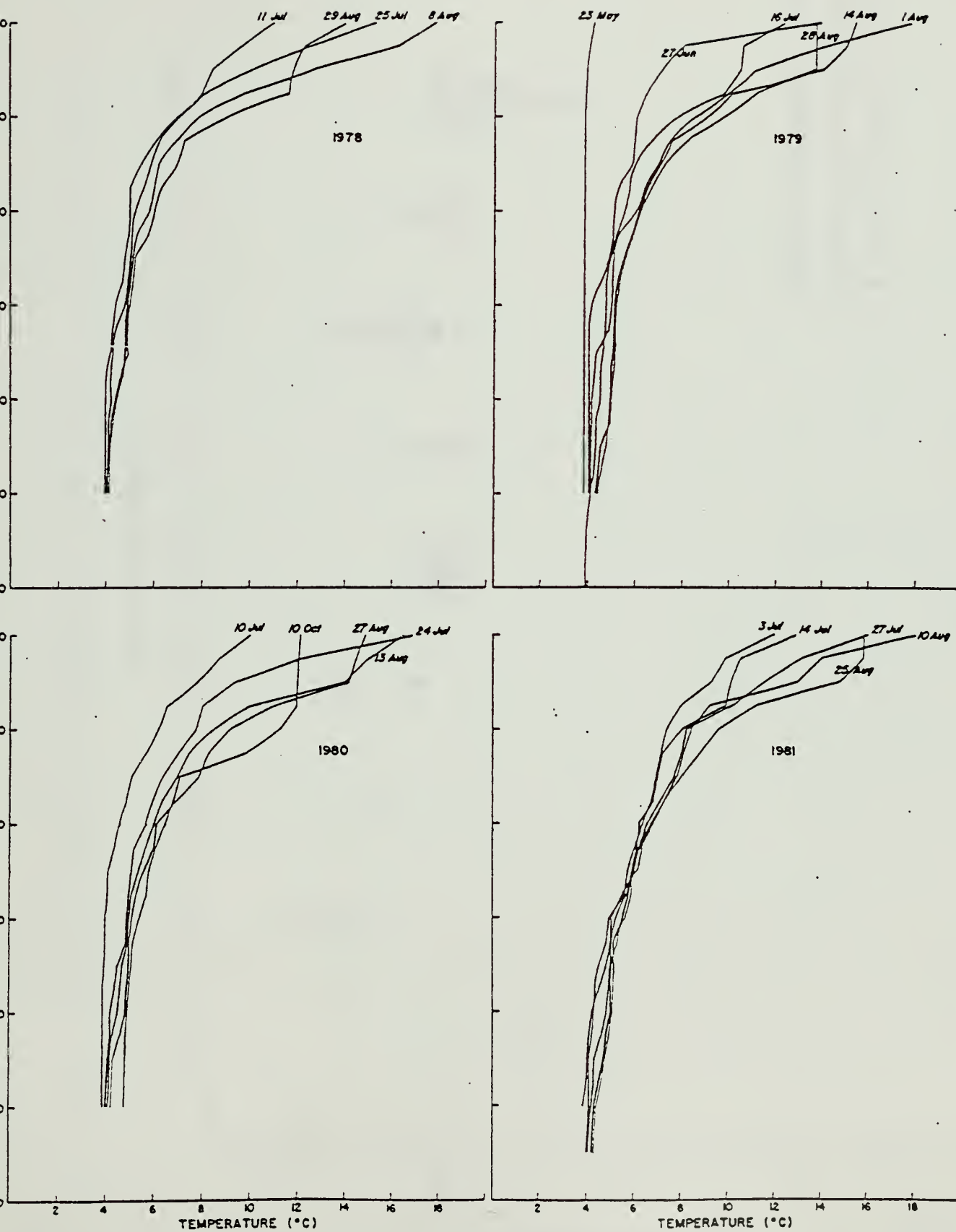


Figure 3. Thermal profiles for Crater Lake, 1978-1981.

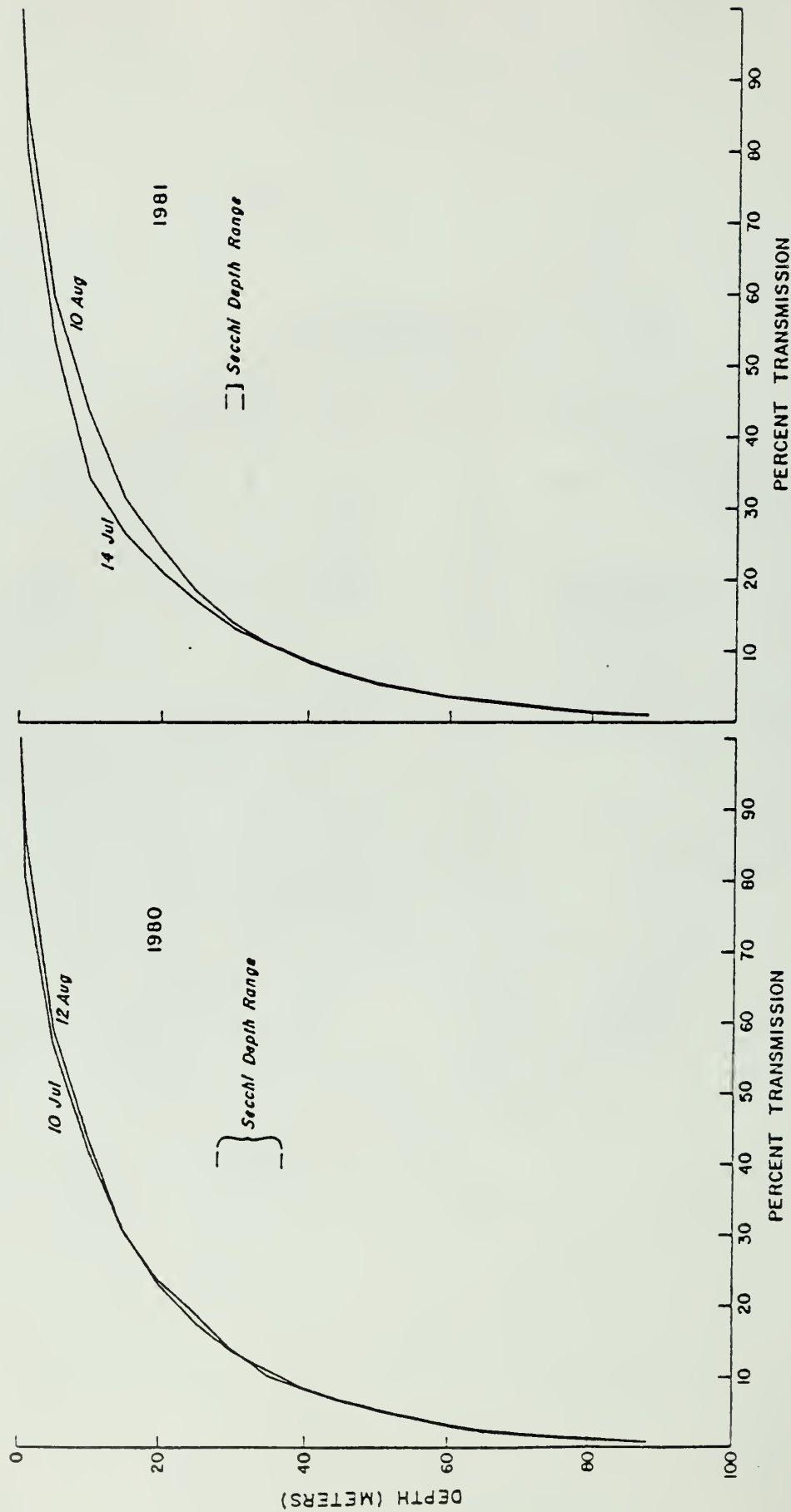


Figure 2. Photometer and Secchi disk readings for 1980 and 1981, Crater Lake, Profiles show the attenuation of unfiltered light with depth.

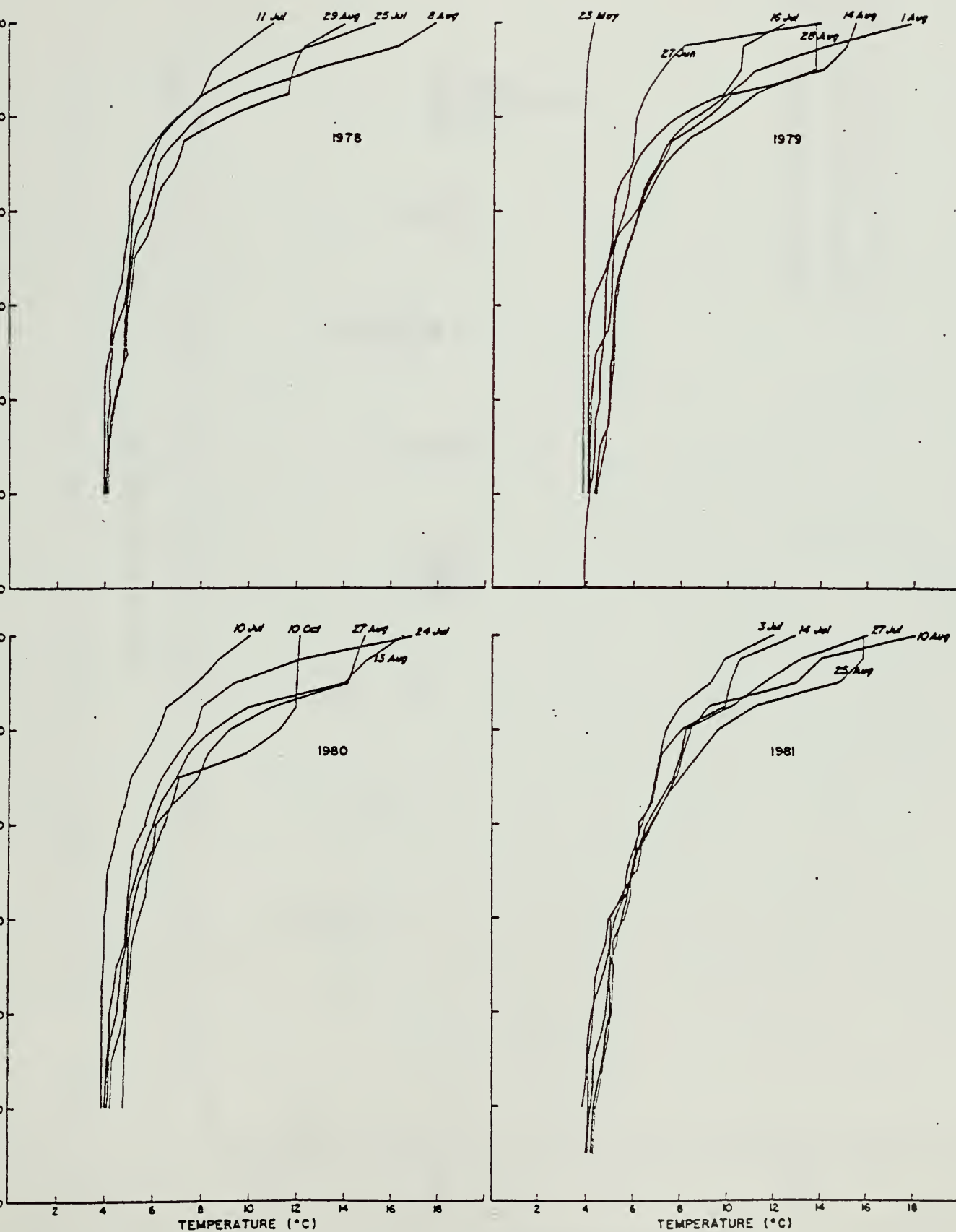


Figure 3. Thermal profiles for Crater Lake, 1978-1981.

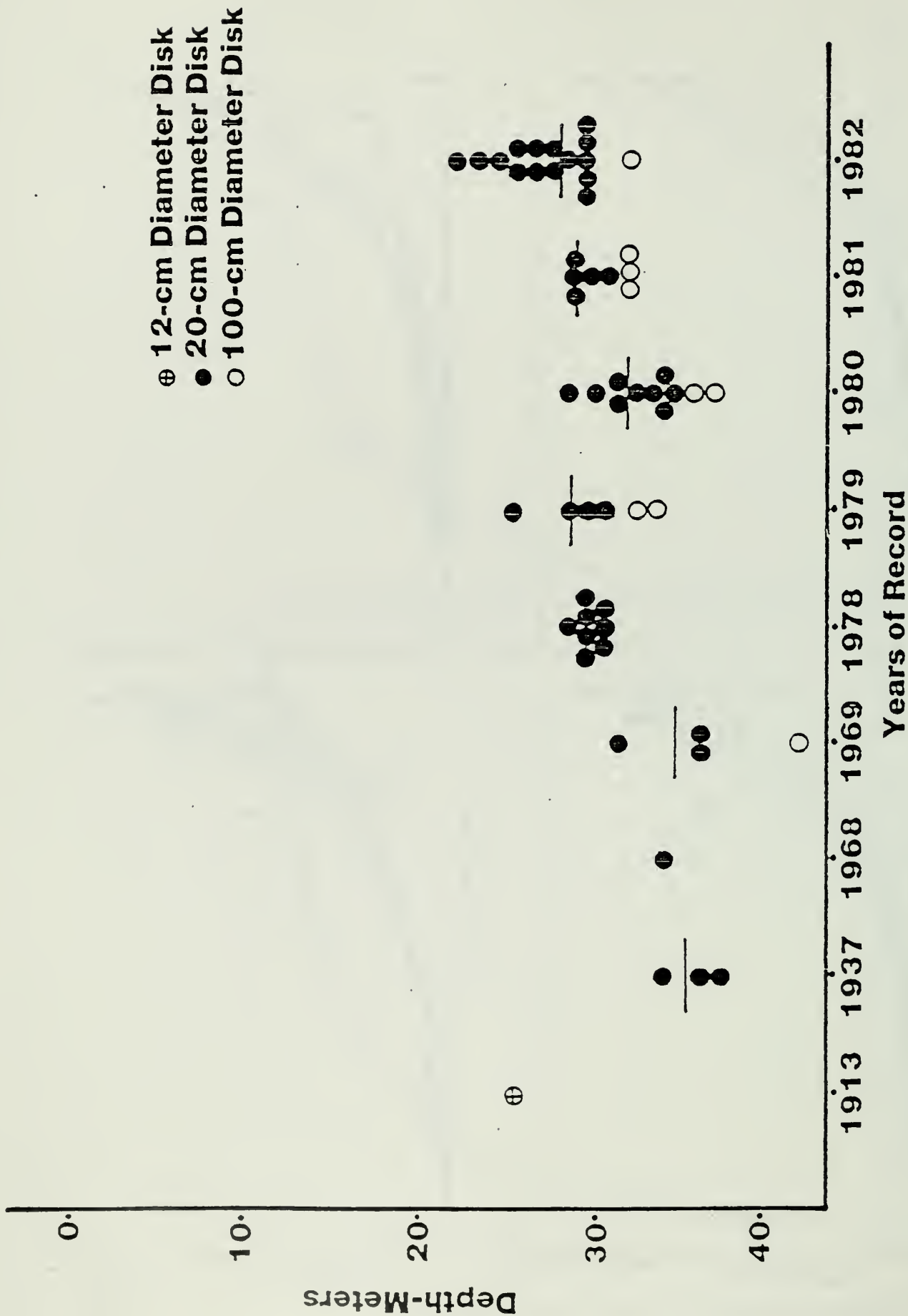


Figure 4. Secchi disk readings for Crater Lake, 1913-1982. Horizontal bars represent mean values. 1982 readings were taken at Station 13.

TABLES

TABLE 1

SECCHI DISK RECORDS 1913-1981

| <u>1913</u> | <u>Meters</u> | <u>Disk Diam.(inches)</u> | <u>Remarks</u> |
|--------------------------|---------------------------------|---------------------------|--------------------------------|
| 1 August | 25 | 4.75 | |
| 5 September | 26 | 4.75 | |
| | $\bar{X} = 26$ | | |
| <u>1937</u> | | | |
| 10 August | 36 | 8.0 | |
| 19 August | 39 | 8.0 | |
| 27 August | 40 | 8.0 | |
| | $\bar{X} = 38$ | | |
| <u>1967</u> | | | |
| August | 18 | 8.0 | Slightly windy and cloudy. |
| <u>1968</u> | | | |
| 14 June | 31 | 8.0 | |
| 23 July | 36 | 8.0 | |
| 27 August | 18 | 8.0 | Reading taken during storm. |
| | $\bar{X} = 28$ | | |
| | $\bar{X} (31 + 36) = 34$ | | |
| <u>1969</u> | | | |
| 16 July | 39 | 8.0 | |
| 16 July | 44 | 40.0 | |
| 5 August | 39 | 8.0 | |
| 31 August | 32 | 8.0 | |
| | $\bar{X} (39 + 39 + 32) = 36.7$ | | |
| <u>1978</u> ¹ | | | |
| 12 July | 28 | clear, windy | 8.0 Jerry Stachiw, PhD |
| 25 July (1100 hrs) | 30 | clear, windy | 8.0 Naval Ocean Systems Center |
| 7 August (1249 hrs) | 29 | clear, calm | 8.0 Code 5204 |
| 8 August (1000 hrs) | 29 | clear, calm | 8.0 San Diego, CA 92152 |
| 28 August (1115 hrs) | 30 | clear, calm | 8.0 Secchi reading on 24-25 |
| 28 August (1345 hrs) | 30 | clear, calm | 8.0 July off wineglass |
| 29 August (1145 hrs) | 29 | clear, calm | 8.0 (several hundred yards): |
| | | | 95 ft. (28.96 m) |
| | $\bar{X} = 29$ | | |

TABLE 1 (cont.)

| <u>1979</u> ^{1.} | | <u>Meters</u> | <u>Disk Diam.(inches)</u> | <u>Remarks</u> |
|---------------------------|-----------|---------------|---------------------------|----------------|
| 27 June | | 28.3 | 8.0 | 1345 - 1450 |
| 27 June | | 28.8 | 4.75 | 1345 - 1450 |
| 16 July | | 31.0 | 8.0 | 1308 - 1338 |
| 16 July | | 35.0 | 40.0 | 1308 - 1338 |
| 1 August | | 29.0 | 8.0 | 1145 - 1215 |
| 1 August | | 34.2 | 40.0 | 1145 - 1215 |
| 1 August | | 28.3 | 4.75 | 1145 - 1215 |
| 14 August | | 22.9 | 8.0 | 1055 - 1110 |
| 14 August | | 28.5 | 40.0 | 1055 - 1110 |
| <u>1980</u> ^{1.} | | | | |
| 10 July | Station 3 | 30.2 | 8.0 | 1130 hrs. |
| 10 July | Station 3 | 33.8 | 40.0 | 1500 hrs. |
| 24 July | Station 1 | 31.9 | 8.0 | 1040 hrs. |
| 24 July | Station 2 | 34.0 | 8.0 | 1110 hrs. |
| 24 July | Station 2 | 36.5 | 40.0 | 1120 hrs. |
| 24 July | Station 3 | 36.3 | 8.0 | 1230 hrs. |
| 24 July | Station 3 | 39.4 | 40.0 | 1250 hrs. |
| 24 July | Station 3 | 36.3 | 8.0 | 1350 hrs. |
| 24 July | Station 4 | 35.2 | 8.0 | 1420 hrs. |
| 25 July | Station 3 | 36.5 | 8.0 | 1240 hrs. |
| 25 July | Station 3 | 39.6 | 40.0 | 1250 hrs. |
| 12 August | Station 3 | 31.9 | 8.0 | 1222 hrs. |
| 12 August | Station 3 | 35.5 | 40.0 | 1208 hrs. |
| <u>1981</u> ^{1.} | | | | |
| 3 July | | 29.7 | 8.0 | @0930 |
| 3 July | | 33.3 | 40.0 | @0930 |
| 13 July | | 28.7 | 8.0 | |
| 13 July | | 31.7 | 40.0 | |
| 27 July | | 29.3 | 8.0 | @1125 |
| 27 July | | 33.2 | 40.0 | @1125 |
| 10 August | Station 2 | 29.1 | 8.0 | |
| 10 August | Station 2 | 32.5 | 40.0 | |
| 11 August | Station 3 | 31.1 | 8.0 | |
| 11 August | Station 1 | 30.4 | 40.0 | |

1. Unpublished data courtesy of D.W.Larson.

TABLE 2

WEATHER CONDITIONS, SUMMER 1982

| | |
|-----------|---|
| July 12 | Clear skies and calm lake |
| July 15 | Clear skies and calm lake |
| July 16 | Clear skies and calm lake |
| July 19 | Sunny; slight breeze, slight ripples |
| July 21 | Partly cloudy, slight ripples, wind came up and forced stop to sampling |
| July 23 | Partly cloudy, slight wind, slight ripple |
| July 26 | Hazy, partly cloudy, lake calm |
| July 27 | Partly cloudy to cloudy, slight haze over lake, slight ripples |
| July 28 | Clear skies, slight cloud puffs, calm lake |
| July 29 | Clear skies, calm lake |
| August 1 | Total cloud cover, choppy lake |
| August 3 | Lake too choppy for sampling, moderate to strong winds, total cloud cover |
| August 4 | Choppy lake, moderate winds, partly cloudy skies |
| August 5 | Calm lake, clear skies, choppy lake in afternoon |
| August 6 | Calm lake, clear skies |
| August 9 | Bad weather - no sampling |
| August 10 | Lake surface too rough for sampling; cloudy, cold, choppy |
| August 11 | Lake surface too rough - no sampling; attached new winch system to boat deck |
| August 12 | Clear skies, lake calm |
| August 13 | Lake surface too rough for sampling |
| August 16 | Lake surface too rough for sampling |
| August 17 | Clear skies, calm lake 1040 hrs; clear skies, mild to choppy 1137 hrs; too choppy for sampling in afternoon |

TABLE 2 (cont.)

| | |
|-------------|--|
| August 21 | Clear skies, calm lake |
| August 23 | Lake conditions too choppy for sampling afternoon, therefore, no temperature or Secchi data. Clear skies, calm lake before noon. |
| September 1 | Sunny but hazy, calm lake |
| September 2 | Partly cloudy, lake calm |
| September 3 | Lake conditions too choppy for sampling |
| September 7 | Hazy skies, lake calm (final sampling day) |

TABLE 3

1982
TEMPERATURE PROFILES (°C)
STATION 13

| | JULY | | | | | | AUGUST | | | | | | SEPTEMBER | | |
|-------------------|------|------|------|------|------|------|--------|------|------|------|------|------|-----------|------|------|
| DEPTH (METERS) | 12 | 21 | 23 | 26 | 27 | 29 | 1 | 5 | 6 | 12 | 17 | 21 | 1 | 2 | 7 |
| Surface | 17.5 | 14.0 | 12.8 | 15.0 | 15.9 | 19.0 | 15.0 | 14.6 | 15.8 | 15.0 | 14.6 | 19.2 | 16.1 | 16.4 | 15.0 |
| 1 | 12.0 | 13.0 | 12.0 | 14.5 | 14.9 | 16.0 | 15.0 | 14.1 | 14.8 | 14.0 | 14.2 | 14.6 | 14.8 | 15.4 | 14.9 |
| 2 | 11.5 | 12.5 | 12.0 | 13.2 | 14.7 | 15.5 | 15.0 | 14.0 | 14.5 | 13.8 | 14.0 | 14.3 | 14.5 | 15.0 | 14.6 |
| 3 | 11.0 | 12.3 | 12.0 | 12.0 | 12.8 | 14.0 | 14.8 | 13.9 | 13.9 | 13.8 | 14.0 | 14.3 | 14.5 | 14.9 | 14.5 |
| 4 | 11.0 | 12.1 | 12.0 | 11.5 | 11.8 | 12.5 | 14.6 | 13.7 | 13.2 | 13.8 | 14.0 | 14.2 | 14.5 | 14.8 | 14.5 |
| 5 | 11.0 | 12.0 | 11.9 | 11.2 | 11.7 | 12.0 | 14.5 | 13.4 | 13.1 | 13.8 | 13.9 | 14.2 | 14.2 | 14.7 | 14.4 |
| 6 | 11.0 | 12.0 | 11.5 | 11.0 | 11.0 | 11.9 | 14.5 | 13.1 | 13.1 | 13.8 | 13.9 | 14.1 | 14.2 | 14.5 | 14.4 |
| 7 | 10.8 | 12.0 | 11.0 | 10.2 | 10.5 | 11.6 | 14.1 | 13.0 | 13.0 | 13.6 | 13.9 | 14.0 | 14.2 | 14.5 | 14.4 |
| 8 | 10.8 | 11.0 | 10.0 | 10.0 | 9.9 | 11.1 | 13.8 | 12.9 | 12.2 | 13.6 | 13.8 | 14.0 | 14.1 | 14.5 | 14.2 |
| 9 | 10.2 | 10.9 | 9.5 | 9.5 | 9.0 | 10.9 | 11.9 | 12.1 | 11.2 | 13.2 | 13.6 | 14.0 | 14.1 | 14.5 | 14.2 |
| 10 | 10.0 | 10.2 | 9.0 | 9.0 | 9.0 | 10.1 | 11.0 | 10.1 | 10.8 | 13.2 | 13.5 | 13.9 | 14.0 | 14.5 | 14.2 |
| 11 | 9.3 | 9.8 | 8.8 | 9.0 | 8.8 | 10.0 | 10.0 | 9.2 | 9.9 | 13.0 | 13.0 | 13.4 | 13.9 | 14.5 | 14.0 |
| 12 | 9.0 | 9.0 | 8.5 | 8.5 | 8.2 | 9.9 | 9.0 | 9.0 | 9.3 | 12.0 | 11.9 | 13.4 | 12.9 | 14.2 | 13.9 |
| 13 | 8.9 | 8.5 | 8.2 | 8.0 | 8.1 | 9.3 | 8.8 | 8.9 | 9.0 | 10.2 | 11.8 | 11.2 | 11.9 | 13.9 | 13.0 |
| 14 | 8.2 | 8.1 | 8.1 | 7.9 | 8.0 | 8.9 | 8.0 | 8.2 | 9.0 | 9.0 | 9.4 | 10.0 | 10.0 | 12.8 | 11.8 |
| 15 | 8.0 | 8.0 | 8.0 | 7.9 | 7.7 | 8.5 | 7.8 | 8.0 | 8.5 | 8.8 | 9.0 | 9.0 | 9.5 | 10.5 | 10.5 |
| 16 | 7.5 | 7.2 | 7.9 | 7.5 | 7.3 | 8.0 | 7.5 | 7.8 | 8.5 | 8.2 | 8.8 | 8.9 | 9.0 | 9.3 | 10.0 |
| 17 | 7.2 | 7.0 | 7.6 | 7.0 | 7.2 | 7.9 | 7.1 | 7.2 | 8.2 | 8.0 | 8.0 | 8.7 | 8.9 | 8.8 | 9.5 |
| 18 | 7.0 | 6.8 | 7.5 | 7.0 | 7.2 | 7.2 | 7.0 | 6.9 | 7.9 | 7.9 | 7.8 | 8.5 | 8.5 | 8.3 | 9.0 |
| 19 | 6.8 | 6.5 | 7.1 | 6.9 | 7.1 | 6.9 | 7.0 | 6.6 | 7.5 | 7.9 | 7.2 | 8.1 | 8.5 | 8.0 | 8.0 |
| 20 | 6.5 | 6.2 | 7.0 | 6.2 | 7.0 | 6.5 | 6.8 | 6.2 | 7.2 | 7.0 | 7.0 | 7.7 | 8.0 | 7.8 | 7.9 |
| 25 | 5.0 | 5.8 | 6.1 | 6.0 | 6.0 | 5.9 | 6.0 | 5.9 | 6.2 | 6.2 | 6.2 | 6.8 | 6.8 | 6.9 | 7.0 |
| 30 | 4.9 | 5.2 | 5.9 | 5.5 | 5.2 | 5.6 | 5.5 | 5.3 | 6.0 | 5.8 | 5.8 | 6.1 | 6.1 | 6.2 | 6.4 |
| 35 | 4.8 | 5.0 | 5.6 | 5.0 | 5.0 | 5.1 | 5.2 | 5.0 | 5.5 | 5.2 | 5.2 | 5.9 | 5.9 | 5.9 | 5.9 |
| 40 | 4.2 | 4.9 | 5.2 | 4.9 | 4.9 | 5.0 | 5.0 | 5.0 | 5.1 | 5.2 | 5.0 | 5.4 | 5.4 | 5.5 | 5.2 |
| 45 | 4.0 | 4.6 | 5.0 | 4.8 | 4.8 | 4.9 | 4.9 | 4.9 | 5.0 | 5.0 | 5.0 | 5.1 | 5.1 | 5.1 | 5.0 |
| 50 | 4.0 | 4.5 | 4.9 | 4.5 | 4.2 | 4.7 | 4.8 | 4.7 | 4.9 | 4.9 | 4.8 | 5.0 | 5.0 | 5.0 | 5.0 |
| 55 | 4.0 | 4.2 | 4.8 | 4.2 | 4.1 | 4.5 | 4.5 | 4.5 | 4.9 | 4.6 | 4.5 | 4.9 | 4.9 | 4.9 | 4.9 |
| 60 | 4.0 | 4.0 | 4.5 | 4.1 | 4.0 | 4.2 | 4.2 | 4.3 | 4.5 | 4.5 | 4.2 | 4.7 | 4.8 | 4.9 | 4.6 |
| 65 | 4.0 | 4.0 | 4.5 | 4.0 | 4.0 | 4.2 | 4.2 | 4.1 | 4.5 | 4.2 | 4.1 | 4.4 | 4.4 | 4.5 | 4.2 |
| 70 | 4.0 | 4.0 | 4.5 | 4.0 | 4.0 | 4.1 | 4.1 | 4.1 | 4.2 | 4.0 | 4.0 | 4.2 | 4.2 | 4.2 | 4.0 |
| 75 | 4.0 | 4.0 | 4.5 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.2 | 4.0 | 4.0 | 4.1 | 4.0 | 4.2 | 4.0 |
| 80 | 3.9 | 4.0 | 4.4 | 3.9 | 3.9 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 |
| 85 | 3.9 | 3.9 | 4.2 | 3.9 | 3.9 | 4.0 | 4.0 | 3.9 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| 90 | 3.9 | 3.9 | 4.2 | 3.9 | 3.8 | 4.0 | 4.0 | 3.9 | 4.0 | 4.0 | 4.0 | 4.0 | 3.9 | 4.0 | 3.9 |
| 95 | 3.9 | 3.9 | 4.2 | 3.8 | 3.8 | 4.0 | 4.0 | 3.9 | 4.0 | 3.9 | 4.0 | 4.0 | 3.9 | 4.0 | 3.9 |
| 100 | 3.8 | 3.9 | 4.1 | 3.8 | 3.8 | 3.9 | 4.0 | 3.9 | 4.0 | 3.9 | 3.9 | 3.9 | 3.9 | 4.0 | 3.9 |
| TIME | 1415 | 1205 | 1015 | 0930 | 1035 | 1405 | 1040 | 1040 | 1045 | 1025 | 1040 | 1230 | NONE | 1135 | NONE |

TABLE 4

1982
TEMPERATURE PROFILES (°C)
STATION 23

| | JULY | | | | AUGUST | | | | | SEPTEMBER | |
|-------------------|------|------|------|------|--------|------|------|------|------|-----------|------|
| DEPTH (METERS) | 23 | 26 | 27 | 29 | 1 | 5 | 6 | 12 | 17 | 1 | 7 |
| Surface | 13.5 | 15.0 | 17.9 | 16.0 | 15.9 | 15.0 | 15.8 | 15.8 | 14.5 | 15.5 | 14.9 |
| 1 | 13.0 | 14.8 | 14.8 | 15.2 | 15.9 | 14.1 | 14.8 | 14.2 | 14.0 | 15.0 | 14.5 |
| 2 | 12.8 | 14.5 | 14.5 | 15.0 | 15.6 | 13.9 | 14.2 | 14.0 | 13.8 | 14.9 | 14.4 |
| 3 | 12.8 | 14.2 | 14.1 | 14.4 | 15.2 | 13.9 | 14.0 | 13.8 | 13.8 | 14.8 | 14.4 |
| 4 | 12.8 | 13.6 | 13.4 | 13.8 | 14.8 | 13.9 | 13.9 | 13.8 | 13.8 | 14.5 | 14.3 |
| 5 | 12.8 | 13.2 | 13.2 | 13.2 | 13.5 | 13.9 | 13.8 | 13.8 | 13.8 | 14.5 | 14.3 |
| 6 | 12.8 | 13.0 | 13.0 | 13.0 | 13.5 | 13.8 | 13.8 | 13.5 | 13.8 | 14.5 | 14.3 |
| 7 | 12.8 | 12.8 | 12.9 | 12.9 | 13.2 | 13.4 | 13.8 | 13.5 | 13.8 | 14.5 | 14.3 |
| 8 | 12.7 | 12.0 | 12.6 | 12.4 | 13.2 | 13.1 | 13.5 | 13.2 | 13.8 | 14.5 | 14.3 |
| 9 | 12.0 | 11.2 | 11.8 | 12.0 | 13.1 | 13.1 | 13.0 | 13.2 | 13.8 | 14.5 | 14.2 |
| 10 | 11.0 | 10.8 | 10.3 | 11.3 | 12.5 | 12.8 | 12.9 | 12.5 | 13.5 | 14.2 | 14.2 |
| 11 | 10.0 | 10.0 | 9.9 | 10.7 | 12.0 | 11.7 | 11.8 | 11.2 | 13.0 | 13.9 | 14.2 |
| 12 | 9.8 | 9.9 | 9.1 | 10.0 | 11.8 | 10.7 | 10.6 | 10.2 | 12.2 | 12.9 | 13.8 |
| 13 | 9.2 | 9.2 | 8.9 | 9.4 | 10.8 | 9.9 | 10.2 | 10.0 | 12.0 | 11.5 | 12.9 |
| 14 | 9.0 | 9.0 | 8.4 | 8.9 | 10.1 | 9.4 | 9.6 | 9.1 | 10.9 | 10.9 | 12.0 |
| 15 | 9.0 | 8.5 | 7.9 | 8.0 | 9.8 | 9.3 | 9.1 | 8.9 | 9.9 | 10.2 | 11.0 |
| 16 | 8.2 | 8.2 | 7.3 | 7.9 | 9.0 | 9.0 | 8.9 | 8.1 | 9.9 | 9.5 | 10.0 |
| 17 | 8.1 | 8.0 | 7.1 | 7.4 | 8.8 | 8.7 | 8.2 | 7.9 | 9.0 | 9.0 | 9.5 |
| 18 | 8.0 | 7.5 | 7.0 | 7.0 | 8.1 | 8.6 | 8.2 | 7.8 | 9.0 | 9.0 | 9.2 |
| 19 | 7.9 | 7.0 | 6.6 | 6.8 | 8.0 | 8.2 | 8.1 | 7.5 | 8.5 | 8.9 | 8.9 |
| 20 | 7.5 | 6.9 | 6.2 | 6.4 | 7.0 | | 8.0 | 7.2 | 8.0 | 8.1 | 8.2 |
| 25 | 7.0 | 6.0 | 5.7 | 5.9 | 6.2 | | 6.2 | 6.0 | 7.2 | 7.0 | 7.5 |
| 30 | 6.1 | 5.8 | 5.2 | 5.3 | 6.0 | | 5.5 | 5.9 | 6.0 | 6.2 | 6.2 |
| 35 | 5.9 | 5.2 | 5.0 | 5.1 | 5.5 | | 5.2 | 5.2 | 5.5 | 5.9 | 5.9 |
| 40 | 5.5 | 5.0 | 4.9 | 5.0 | 5.1 | | 5.0 | 5.0 | 5.0 | 5.2 | 5.5 |
| 45 | 5.2 | 5.0 | 4.7 | 4.7 | 5.0 | | 5.0 | 4.9 | 4.9 | 4.9 | 5.0 |
| 50 | 5.0 | 4.8 | 4.5 | 4.4 | 4.9 | | 4.8 | 4.8 | 4.6 | 4.2 | 4.9 |
| 55 | 5.0 | 4.5 | 4.2 | 4.2 | 4.5 | | 4.5 | 4.5 | 4.2 | 4.1 | 4.8 |
| 60 | 5.0 | 4.2 | 4.1 | 4.1 | 4.3 | | 4.2 | 4.2 | 4.2 | 4.1 | 4.3 |
| 65 | 5.0 | 4.1 | 4.0 | 4.0 | 4.2 | | 4.1 | 4.2 | 4.1 | 4.0 | 4.1 |
| 70 | 4.9 | 4.1 | 4.0 | 4.0 | 4.1 | | 4.0 | 4.2 | 4.0 | 4.0 | 4.0 |
| 75 | 4.9 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.9 | 4.0 |
| 80 | 4.8 | 4.0 | 3.9 | 3.9 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.9 | 4.0 |
| 85 | 4.5 | 4.0 | 3.9 | 3.9 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.8 | 3.9 |
| 90 | 4.5 | 4.0 | 3.9 | 3.9 | 4.0 | | 3.9 | 3.9 | 3.9 | 3.8 | 3.9 |
| 95 | 4.2 | 4.0 | 3.9 | 3.9 | 4.0 | | 3.9 | 3.9 | 3.9 | 3.6 | 3.9 |
| 100 | 4.2 | 3.9 | 3.8 | 3.9 | 4.0 | | 3.9 | 3.9 | 3.9 | 3.5 | 3.8 |
| TIME | 1135 | 1100 | 1210 | 0945 | 1115 | 1208 | 1150 | 1210 | 1137 | NONE | 1125 |

TABLE 5

1982
pH - ALKALINITY - DISSOLVED OXYGEN
STATION 13

| <u>Depth (m)</u> | <u>15 July</u> | | | <u>21 July</u> | | |
|------------------|-----------------------|-------------------------|-----------------------|----------------|-------------|-----------|
| | <u>pH¹</u> | <u>Alk.²</u> | <u>DO³</u> | <u>pH</u> | <u>Alk.</u> | <u>DO</u> |
| Surface | 7.90 | 29.7 | 12.1 | 7.90 | 28.8 | 10.9 |
| 50 | 7.80 | 29.7 | 14.7 | 7.80 | 28.8 | 13.2 |
| 100 | 7.70 | 29.3 | 14.4 | 7.80 | 28.8 | 13.5 |
| 150 | 7.65 | 29.7 | 14.2 | 7.70 | 29.3 | 12.6 |
| 200 | 7.65 | 31.1 | 14.2 | 7.60 | 29.3 | 12.6 |
| 250 | 7.60 | 29.7 | 13.8 | 7.60 | 29.7 | 12.6 |
| 300 | 7.50 | 28.8 | 13.6 | 7.50 | 29.7 | 12.6 |

| <u>Depth (m)</u> | <u>27 July</u> | | | <u>23 August</u> | | |
|------------------|----------------|-------------|-----------|------------------|-------------|-----------|
| | <u>pH</u> | <u>Alk.</u> | <u>DO</u> | <u>pH</u> | <u>Alk.</u> | <u>DO</u> |
| Surface | 7.85 | 29.7 | 9.6 | 7.80 | 28.8 | 9.3 |
| 50 | 7.75 | 29.7 | 12.9 | 7.78 | 28.8 | 11.2 |
| 100 | 7.70 | 30.6 | 12.5 | 7.70 | 29.3 | 12.5 |
| 150 | 7.63 | 29.7 | 12.2 | 7.65 | 29.3 | 11.7 |
| 200 | 7.50 | 28.8 | 11.8 | 7.60 | 29.7 | 10.8 |
| 250 | 7.50 | 28.8 | 11.9 | 7.50 | 29.7 | 12.2 |
| 300 | 7.50 | 29.7 | 12.9 | 7.50 | 30.0 | 10.7 |

| <u>Depth (m)</u> | <u>7 September</u> | | |
|------------------|--------------------|-------------|-----------|
| | <u>pH</u> | <u>Alk.</u> | <u>DO</u> |
| Surface | 7.80 | 29.1 | 9.8 |
| 50 | 7.80 | 29.1 | 12.3 |
| 100 | 7.73 | 28.8 | 11.8 |
| 150 | 7.69 | 29.3 | 10.4 |
| 200 | 7.62 | 29.4 | 10.9 |
| 250 | 7.59 | 29.7 | 12.2 |
| 300 | 7.50 | 30.2 | 11.9 |

STATION 23

| <u>Depth (m)</u> | <u>27 July</u> | | | <u>7 September</u> | | |
|------------------|----------------|-------------|-----------|--------------------|-------------|-----------|
| | <u>pH</u> | <u>Alk.</u> | <u>DO</u> | <u>pH</u> | <u>Alk.</u> | <u>DO</u> |
| Surface | 7.80 | 29.3 | 9.6 | 7.85 | 29.3 | 10.2 |
| 50 | 7.70 | 28.8 | 12.3 | 7.78 | 29.5 | 13.0 |
| 100 | 7.62 | 29.7 | 12.6 | 7.69 | 29.7 | 11.6 |
| 150 | 7.60 | 29.7 | 11.8 | 7.65 | 29.9 | 12.3 |
| 200 | 7.63 | 29.7 | 11.5 | 7.60 | 30.2 | 12.0 |
| 250 | 7.50 | 28.8 | 11.2 | 7.60 | 30.2 | 14.0 |
| 300 | 7.50 | 29.7 | 11.3 | 7.55 | 30.2 | 12.2 |

¹ - pH in pH units

² - alkalinity in mg/liter as CaCO₃

³ - dissolved oxygen in mg/liter

TABLE 6. Representative profiles of dissolved oxygen (mg/liter), pH, and total alkalinity (mg/liter CaCO) for Crater Lake¹

| Depth (m) | 23 Jul 68 | | | 16 Jul 69 | | |
|--------------|-----------|-----|---------------|-----------|-----|---------------|
| | DO | pH | Total alk. | DO | pH | Total alk. |
| 0 | 8.76 | 7.2 | 29.1 | 9.44 | 7.4 | 29.2 |
| 20 | 10.10 | 7.2 | 29.1 | 10.20 | 7.5 | 29.0 |
| 40 | 10.60 | 7.2 | 29.0 | 10.82 | 7.5 | 29.0 |
| 60 | 10.60 | 7.2 | 29.1 | | | |
| 70 | | | | 10.48 | 7.5 | 29.5 |
| 80 | 10.60 | 7.4 | 29.0 | | | |
| 100 | 10.44 | 7.4 | 28.7 | | | |
| 110 | | | | 10.50 | 7.6 | 29.3 |
| 130 | 10.24 | 7.4 | 28.9 | | | |
| 200 | | | | 10.54 | 7.5 | 29.2 |
| 300 | 10.16 | 7.4 | 28.8 | | | |
| 400 | 10.00 | 7.4 | 28.8 | | | |
| 500 | 9.90 | 7.3 | 29.0 | | | |

¹ D.W. Larson. 1972. Temperature, Transparency, and Phytoplankton Productivity in Crater Lake, Oregon. *Limnol. Oceanog.* 17(3): 410-417.

TABLE 7

1982
CHLOROPHYLL - PHYTOPLANKTON
COLLECTIONS
STATION 13

| Depth (m) | <u>15 July</u> | | <u>21 July</u> | | <u>29 July</u> | |
|-----------|----------------|----------------------------|----------------|--------------|----------------|--------------|
| | <u>CHL</u> | <u>PHYTO</u> ^{1.} | <u>CHL</u> | <u>PHYTO</u> | <u>CHL</u> | <u>PHYTO</u> |
| Surface | X | 96 | X | - | X | 25 |
| 10 | - | - | X | - | X | 24 |
| 20 | X | 95 | X | - | X | 26 |
| 40 | X | 94 | X | - | X | 21 |
| 60 | X | 93 | X | - | X | 22 |
| 80 | X | 92 | X | - | X | 23 |
| 100 | X | 91 | X | - | X | 18 |
| 120 | X | 90 | X | - | X | 19 |
| 140 | X | 89 | X | - | X | 20 |
| 160 | X | 88 | X | - | X | 15 |
| 180 | X | 87 | X | - | X | 16 |
| 200 | X | 86 | X | - | X | 17 |

| Depth (m) | <u>5 August</u> | | <u>23 August</u> | | <u>1 September</u> | | <u>2 September</u> | |
|-----------|-----------------|--------------|------------------|--------------|--------------------|--------------|--------------------|--------------|
| | <u>CHL</u> | <u>PHYTO</u> | <u>CHL</u> | <u>PHYTO</u> | <u>CHL</u> | <u>PHYTO</u> | <u>CHL</u> | <u>PHYTO</u> |
| Surface | X | - | X | 55 | X | P-12 | X | 8 |
| 10 | X | - | X | 57 | X | P-11 | - | - |
| 20 | X | - | X | 58 | X | P-10 | - | - |
| 40 | X | - | X | 59 | X | P-9 | X | 9 |
| 60 | X | - | X | 67 | X | P-8 | - | - |
| 80 | X | - | X | 49 | X | P-7 | X | 10 |
| 100 | X | - | X | 50 | X | P-1 | X | 11 |
| 120 | X | - | X | 51 | X | P-2 | X | 12 |
| 140 | X | - | X | 52 | X | P-3 | - | - |
| 160 | X | - | X | 53 | X | P-4 | X | 13 |
| 180 | X | - | X | 54 | X | P-5 | - | - |
| 200 | X | - | X | 56 | X | P-6 | X | 14 |

STATION 23

| Depth (m) | <u>29 July</u> | | <u>1 September</u> | |
|-----------|----------------|--------------|--------------------|--------------|
| | <u>CHL</u> | <u>PHYTO</u> | <u>CHL</u> | <u>PHYTO</u> |
| Surface | X | 32 | X | P-63 |
| 10 | X | 65 | X | P-64 |
| 20 | X | 64 | X | P-65 |
| 40 | X | 63 | X | P-66 |
| 60 | X | 62 | X | P-67 |
| 80 | X | 53 | X | P-68 |
| 100 | X | 44 | X | P-69 |
| 120 | X | 50 | X | P-70 |
| 140 | X | 47 | X | P-71 |
| 160 | X | 35 | X | P-72 |
| 180 | X | 38 | X | P-73 |
| 200 | X | 41 | X | P-74 |

1.-- bottle numbers given

2.-- data recorded on filter wraps

TABLE 8

1982
SECCHI DISK READINGS
(8" Diameter Disk)

| | <u>Station</u> | <u>Time</u> | <u>Depth (m)</u> |
|-------------|----------------|-------------|------------------|
| 12 July | 13 | 12:30 | 29.30 |
| 12 July | 13 | 12:40 | 33.00 (40" Disk) |
| 16 July | 13 | None | 28.50 |
| 21 July | 13 | 11:50 | 28.48 |
| 23 July | 13 | 10:30 | 29.01 |
| | 25 | 11:05 | 30.16 |
| | 23 | 11:30 | 29.70 |
| | 16 | 12:00 | 28.30 |
| | 11 | 12:30 | 30.60 |
| 26 July | 13 | 10:00 | 28.40 |
| | 25 | 11:00 | 29.30 |
| | 23 | 11:25 | 26.27 |
| | 16 | 12:00 | 28.80 |
| | 11 | 12:15 | 29.04 |
| 28 July | 13 | 11:00 | 28.70 |
| | 25 | 11:25 | 29.20 |
| | 16 | 12:05 | 26.90 |
| | 11 | 12:45 | 30.70 |
| 5 August | 13 | 11:30 | 25.30 |
| 6 August | 13 | 11:10 | 26.70 |
| | 25 | 11:30 | 25.20 |
| | 23 | 11:50 | 25.10 |
| | 16 | 12:45 | 25.00 |
| | 11 | 13:00 | 28.00 |
| 12 August | 13 | 10:45 | 24.10 |
| | 25 | 11:40 | 24.10 |
| | 23 | 12:05 | 24.80 |
| | 16 | 12:35 | 24.60 |
| | 11 | 12:45 | 23.30 |
| 17 August | 13 | 11:05 | 22.90 |
| | 25 | 11:20 | 23.70 |
| | 11 | 12:30 | 22.60 |
| 21 August | 13 | 12:15 | 21.90 |
| 26 August | 13 | 12:19 | 25.00 |
| 1 September | 13 | 11:30 | 26.00 |
| | 23 | None | 26.20 |
| 2 Sept. | 13 | 11:15 | 25.80 |
| 7 Sept. | 23 | 12:30 | 27.00 |

APPENDIX I

APPENDIX I
EQUIPMENT AND SUPPLIES OBTAINED FOR
WATER QUALITY PROGRAM IN 1982

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|---|-----------------|-------------------|
| 1. Pontoon Boat, Model DC-26, with 8' x 24' deck | 1 | \$ 5,532.00 |
| 2. Johnson 35hp Outboard Motor, Model J35 ELCN | 1 | \$ 1,315.44 |
| 3. Snatch Block Meter Wheel, w/dials, Reading in <u>Meters</u> #252WA220 | 1 | \$ 709.00 |
| 4. Heavy Duty Hand Winch, #317WA102, Hednaw | 1 | \$ 599.00 |
| 5. Belfort Pyrheliograph (solar radiation recorder) Cat. #5-3850A | 1 | \$ 736.00 |
| 6. Charts for pyrheliograph <u>192</u> hour 100 charts in the package | 1 pkg. | \$ 12.50 |
| 7. Thermistor (Thermograph) Model TC-5, with 250 Meters of Cable, Montedoro-Whitney | 1 | \$ 2,763.00 |
| 8. pH Meter, Beckman Altex Expand-Mate Cat.No.34101-213 | 1 | \$ 495.00 |
| 9. Van Dorn Bottles, 4 liter volume, PVC, Vertical | 5 | \$ 1,050.00 |
| 10. Brass Van Dorn Bottle Messengers | 2 | \$ 70.00 |
| 11. Wire Rope for Winch, 1/8 inch Diameter | 1,000 ft. | \$ 290.00 |
| 12. Conductivity Bridge, YSI Model #23200-009 | 1 | \$ 729.00 |
| 13. Conductivity Cell, Pyrex, Yellowsprings Model 3402 Cat. No. 23201-045 | 1 | \$ 148.00 |
| 14. KCL conductance solution, 0.01 M, 32 oz., Cat. No. AL51340-4 | 1 bottle | \$ 13.00 |
| 15. pH Meter, Model 5, Corning 47500 #34103-300 | 1 | \$ 495.00 |

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|---|-----------------|-------------------|
| 16. Combination pH Meter Electrode, Glass, 12mm, Altex by Beckman, Cat. No. 34105-101 | 1 | \$ 86.00 |
| 17. Buffer Solution, pH 7, Cat. No. 34180-286 | 8 pints | \$ 40.16 |
| 18. Buffer Solution, pH 4, Cat. No. 34180-253 | 2 pints | \$ 10.04 |
| 19. Buffer Solution, pH 10, Cat. No. 34180-300 | 2 pints | \$ 10.04 |
| 20. Filter Holder, PVC Manifold, 3 Place, #XX26-047-35, Millipore Corp. | 1 | \$ 314.00 |
| 21. Filters, HAWP, 047-00, Autoclave Packed w/absorbent Pads, Pore Size 0.45 micrometers-47mm, White, Plain, Millipore Corp. | 3 pkgs | \$ 122.70 |
| 22. All Glass Filter Apparatus, 47mm Diameter, #XX15-047-00, Millipore Corp. | 3 | \$ 468.00 |
| 23. Vacuum Pressure Pump, 115 v, 60 HZ, #XX55-000-00 Millipore Corp. | 1 | \$ 377.00 |
| 24. Glass Funnel, Cat. #XX10-047-04, Millipore Corp. | 3 | \$ 117.30 |
| 25. Glass Base, Cat. #XX10-047-02 Millipore Corp. | 3 | \$ 152.10 |
| 26. Clamps, Cat. #XX10-047-03 Millipore Corp. | 3 | \$ 81.30 |
| 27. Stoppers, Cat #XX10-047-08 Millipore Corp. | 1 set | \$ 32.40 |
| 28. Magnetic Stirrer (GS-005-45063), #58935-250 | 1 | \$ 93.00 |
| 29. Thermometers, Celsius, #61066-046 | 3 | \$ 14.58 |
| 30. Stand, Buret Support, 329-00 | 1 | \$ 31.90 |
| 31. Stand, Buret, Double, 328-00 | 1 | \$ 15.15 |
| 32. Air Horn, Hand-held, with Extra Can | 1 | \$ 11.95 |
| 33. Carboy, Nalgene, with Spigot (50 liters) #16334-264 | 1 | \$ 62.89 |

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|---|-----------------|-------------------|
| 34. Burets, Kimax, 50 ml Cap. #17454-443 | 2 | \$ 33.30 |
| 35. Burets, Accu-red, 100 ml Cap., Pyrex (Corning 2122A), #17452-164 | 2 | \$ 84.10 |
| 36. Burets, Accu-red, Pyrex (Corning 2122A), 10ml capacity, Cat. No. 17452-109 | 2 | \$ 66.60 |
| 37. Flasks, 250 ml, Erlenmeyer (Kimble 26650) #29140-544 | 2 pkgs | \$ 47.08 |
| 38. Flasks, Volumetric, 1000 ml, (Kimble 28014 Series) #29619-653 | 1 case | \$ 112.08 |
| 39. Flasks, Volumetric, 2000 ml, (Kimble 28014 Series) #29619-664 | 2 | \$ 68.50 |
| 40. Flasks, Filter, Kimax, 1000 ml #29415-121 | 2 | \$ 41.56 |
| 41. Beakers, Pyrex, 100 ml, #13912-160 | 1 pkg | \$ 17.55 |
| 42. Beakers, Pyrex, 400 ml, #13912-229 | 1 pkg | \$ 19.54 |
| 43. Beakers, Pyrex, 1000 ml, #13912-284 | 1 pkg | \$ 23.32 |
| 44. Pipettes, Volumetric, 100 ml, #52966-239 | 1 pkg | \$ 72.70 |
| 45. Pipettes, Volumetric, 5 ml, #52961-111 | 1 pkg | \$ 27.11 |
| 46. Pipettes, Volumetric, 10 ml, #52961-133 | 1 pkg | \$ 30.98 |
| 47. Washbottles, 250 ml, #16651-165 | 1 pkg | \$ 8.75 |
| 48. Washbottles, 1000 ml #16651-223 | 1 pkg | \$ 9.00 |
| 49. Reagent Bottles, 1000 ml, #16267-101 | 6 | \$ 111.90 |
| 50. Bottles, Wide Mouth, Amber, 1000 ml, #16127-226 | 4 pkgs | \$ 67.64 |
| 51. Bottles, Wide Mouth, Amber, 500 ml, #16127-204 | 4 pkgs | \$ 77.24 |
| 52. Bottles, Dropper, Safety, 250 ml, 20861-46 | 1 case | \$ 20.20 |

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|---|-------------------------|-------------------|
| 53. Bottle, Dropping Assembly, 250 ml, Nalgene, #16353-101 | 2 pkgs | \$ 32.20 |
| 54. BOD Bottles, 300 ml capacity #16285 | 2 cases (48 bottles) | \$ 205.20 |
| 55. Cylinders, Graduated, 1000 ml #24774-127 | 2 | \$ 22.94 |
| 56. Cylinders, Graduated, 50 ml #24707-061 | 2 | \$ 26.64 |
| 57. Cylinders, Graduated, 100 ml #24707-083 | 2 | \$ 31.04 |
| 58. Cylinders, Graduated, 250 ml #24707-108 | 2 | \$ 41.66 |
| 59. Funnels, Short Stem, Kimax (Kimble 28950), 90mm ID Top | 6 | \$ 26.68 |
| 60. Vacuum Pressure Tubing, 1/4" I.D. #62994-183 | 1 | \$ 19.50 |
| 61. PAO Titrant 0.025N, 3.78 L, 1070-17 | 2 | \$ 49.56 |
| 62. Phenolphthalein Indicator Solution, 473 ml, 1897-11 | 2 | \$ 16.00 |
| 63. Bromcresol Green-Methyl Red Indicator Solution, 473 ml, 451-11 | 2 | \$ 10.00 |
| 64. Starch Indicator Solution, 946 ml, 349-16 | 1 | \$ 6.75 |
| 65. Kimwipes, Cleaning Tissues #21905-047 | 1 case | \$ 61.25 |
| 66. Stopcock Grease, Dow Corning #59344-055 | 2 | \$ 13.98 |
| 67. Johnson Outboard Motor Oil | 2 cases | \$ 70.00 |
| | SUB-TOTAL | \$18,570.00 |

ADDITIONAL PURCHASES (OSU Chemistry Stores)

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|---|-----------------|-------------------|
| 1. Poly Tube Connecting "Y", 1/4" | 12 | \$ 5.28 |
| 2. Poly Tube Connecting "Y", 3/8" | 12 | \$ 7.44 |
| 3. Tubing, Black, Pressure, 3/8 x 5/16 - 1 | 4 ft. | \$ 12.68 |
| 4. Tubing, Black, Pressure, 1/4 x 3/16 - 1 | 4 ft. | \$ 5.32 |
| 5. Scoopulas, Lab | 4 | \$ 1.92 |
| 6. Clamp Pinchcock | 10 | \$ 5.50 |
| 7. Lab-Bench Paper Kimpack, 20" x 0.4" | 300 ft. | \$ 25.42 |
| 8. Paper Filters, Whatman #1 12.5 cm Diameter | 3 pkgs | \$ 6.36 |
| 9. Acid Bottle Safety Carrier, 2-1/2 Liter | 1 | \$ 19.38 |
| 10. Poly Bottle, Narrow Mouth, Screw-Cap, 1 Liter Volume | 216 | \$233.28 |
| 11. Poly Bottle, Narrow Mouth, Screw-Cap, 500 ml Volume | 24 | \$ 21.36 |
| 12. pH Buffer, pH7 | 10 capsules | \$ 3.00 |
| 13. Iodine, Resublimed | 1/4 pound | \$ 21.96 |
| 14. Magnesium Carbonate | 1/4 pound | \$ 8.33 |
| 15. Potassium Iodide | 500 grams | \$ 18.45 |
| 16. Sulfuric Acid | 5 pints | \$ 9.27 |
| 17. Sodium Hydroxide Pellets | 2 pounds | \$ 7.94 |
| 18. Sodium Iodide | 1/4 Pound | \$ 11.15 |
| 19. Sodium Azide | 100 grams | \$ 9.94 |

ADDITIONAL PURCHASES (OSU Chemistry Stores)

| <u>Description</u> | <u>Quantity</u> | <u>Total Cost</u> |
|-----------------------------------|-----------------|-------------------|
| 20. Manganese Sulfate Monohydrate | 2 pounds | \$ 16.68 |
| 21. Drierite, Indicating | 5 pounds | \$ 16.10 |
| 22. Formaldehyde | 1 gallon | <u>\$ 16.46</u> |
| | SUB-TOTAL | \$483.22 |
| | GRAND-TOTAL | \$19,053.22 |

APPENDIX II

JOURNAL OF THE WATER RESOURCES PLANNING AND MANAGEMENT DIVISION

CONVERSATIONAL WATER QUALITY DATA RETRIEVAL SYSTEM

By Douglas W. Larson¹ and Thomas Bingham²

INTRODUCTION

Water resource management often requires the use of a computer to store and manipulate large quantities of data. But data retrieval may present a problem for the investigator or program manager who is inexperienced with computers, terminal communications and commands, and syntax language, or who accesses the stored data so infrequently that each new retrieval session requires, essentially, a costly and perhaps time-consuming "re-learning" of procedures and language. Ideally, the most efficient, useful retrieval system would probably be one requiring the fewest commands in the simplest language. Here we describe a data management system which can be activated and used quickly, with minimal training, jargon, and incentive, while still employing the latest data retrieval software available.

SYSTEM DESCRIPTION

Since 1974, we have collected much physical, chemical, and biological data for reservoirs and rivers in western Oregon. This information is handled through use of the data-base management system SIR (scientific information retrieval) (3), and a FORTRAN program which interfaces SIR with the user. SIR was chosen for several reasons:

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Note.—Discussion open until August 1, 1981. To extend the closing date one month, a written request must be filed with the Manager of Technical and Professional Publications, ASCE. Manuscript was submitted for review for possible publication on February 19, 1980. This paper is part of the Journal of the Water Resources Planning and Management Division, Proceedings of the American Society of Civil Engineers, ©ASCE, Vol. 107, No. WR1, March, 1981. ISSN 0145-0743/81/0001-0239/\$01.00.

1. SIR is a hierarchical system with the capability to pinpoint sub-populations of data, and then process only those portions of the data base at a relatively low cost.

2. SIR has a versatile reporting capability which can produce reports under any format of the user's choice.

3. SIR has a built-in direct link with two major statistical packages designated as the statistical package for social sciences (SPSS) (2) and the biomedical computer programs P-Series (1) via system file creation, which facilitates easy, yet powerful statistical analyses.

The FORTRAN interface program was designed to prompt the user with questions, the answers to which describe the exact nature of the retrieval. SIR

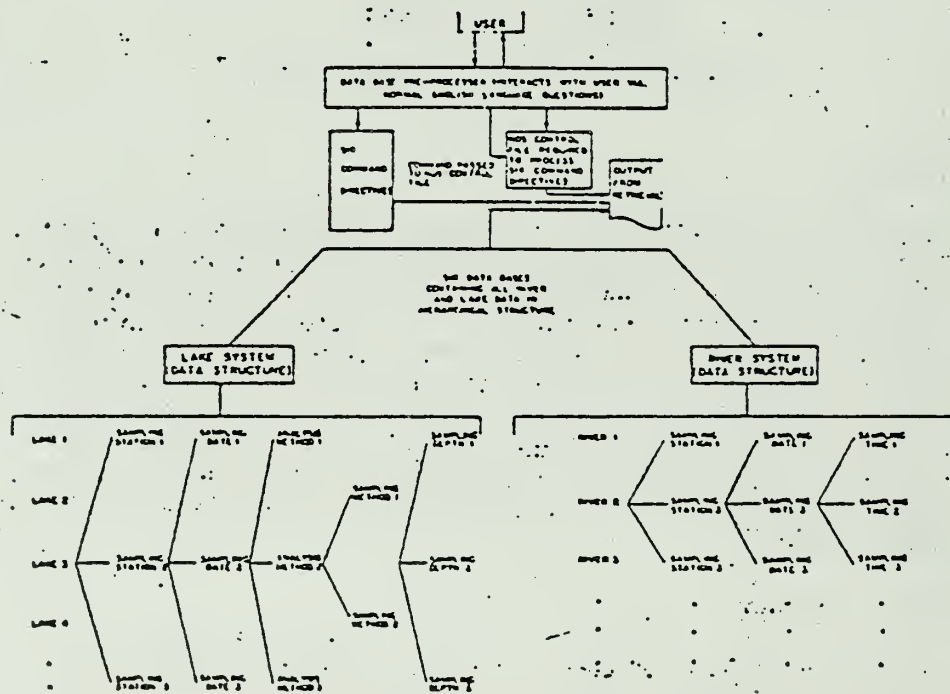


FIG. 1.—Schematic of Water Quality Data Retrieval System (NOS = Network Operating System)

directives, corresponding to the answers as created by the FORTRAN program, are then executed. The results of the retrieval are displayed to the user in the form of the user's choice (see Fig. 1).

For users who might be unfamiliar with the interface program, a self-documenting capability was built into the program so that it could be operated successfully with no user's manual. Essentially, this documentation consists of several "menus" which are displayed individually upon request, thereby giving all available responses to questions about a particular category of information.

Overall, the system combines a tutorial interactive capability with batch

TABLE 1.—Example of Typical Data Retrieval Session Using Conversational Water Quality Data Management System.

| | |
|----|---|
| C> | CALL, RETRIEV |
| | please enter your name: |
| I> | SMITH |
| | enter subject category (0 = menu): |
| I> | 0 |
| | enter one of the following numeric codes: ^a |
| | 1. river data |
| | 2. lake data |
| | 3. groundwater |
| I> | 2 |
| | enter any assortment of record types desired ^a (0 = menu): |
| I> | 0 |
| | 1. nutrients |
| | 2. pesticides |
| | 3. biological |
| I> | 1 3 |
| | enter the numeric codes representing the desired parameters to be retrieved from record type 1 ^a (0 = menu): |
| I> | 0 |
| | 1. nitrate-nitrogen |
| | 2. orthophosphate |
| | 3. silica |
| I> | 1 2 |
| | enter the numeric codes representing the desired parameters to be retrieved from record type 3 ^a (0 = menu): |
| I> | 0 |
| | 1. phytoplankton primary production |
| | 2. phytoplankton chlorophyll concentrations |
| | 3. phytoplankton species composition |
| I> | 2 3 |
| | enter the river/lake basin number ^a (0 = menu): |
| I> | 0 |
| | 1. Columbia |
| | 2. Willamette |
| | 3. Rogue |
| I> | 2 |
| | enter the numeric codes representing the desired lakes to be retrieved from record type 2 ^a (0 = menu): |
| I> | 0 |
| | 1. Lookout Point |
| | 2. Hills Creek |
| | 3. Cougar |
| I> | 2 |
| | enter the desired station numbers ^a (0 = menu): |
| I> | 0 |
| | 1. HCS |
| | 2. HC12 |
| | 3. HC26 |
| I> | HCS HC26 |

TABLE 1.—Continued

| | |
|----|---|
| | enter the date from which the retrieval is to begin. The required format is DD MM YY: |
| I> | 15 5 75 |
| | enter the date on which the retrieval is to end. The required format is DD MM YY: |
| I> | 30 8 78 |
| | enter output options* (0 = menu): |
| I> | 0 |
| | 1. create easy-graph files for plotting |
| | 2. re-sort data records by one or more parameters |
| | 3. create SIR line printer plots of any number of parameter pairs |
| | 4. create an SPSS system file for statistical analyses |
| | 5. print-out requested data |
| I> | 5 |
| | enter your desired job priority* (0 = menu): |
| I> | 0 |
| | 1. standby |
| | 2. four hours turn around |
| | 3. one hour turn around |
| I> | 3 |
| | successful completion of water quality information system |

*An unlimited number of numeric codes, record types, or options can be listed; examples are given.

*The system is not restricted to water quality data; application is intended for other types of data bases.

processing which may contribute to greater flexibility, responsiveness, and ease in data retrieval, and yet be relatively inexpensive and require shorter periods of time at the terminal because of the batch job feature. This differs from systems which exclusively use batch processing to retrieve data—e.g., STORET (4) or WATSTORE (5)—or are purely interactive.

SYSTEM OPERATION

To operate our system, the user first logs on by dialing, in our case, Boeing EKS (Enhanced Kronos System) and providing a user identification code. Completion of log-on is signified by a "C" prompt, i.e., C >. The user then executes system by entering the command "CALL, RETRIEV." From this point on, the system questions the user in "everyday" conversational language concerning information needed to perform the retrieval. If the user is unsure as to how to initiate a response (e.g., to answer a specific question posed by the system), a "menu" of available responses may be activated by entering a "key" number (usually zero) which is also indicated by the system (see Table 1).

If the user enters an invalid response, a "diagnostic" is printed by the program with the request to try again. Thus, "bug-free" SIR directives are always written, thereby freeing the user of the problem of using the "debugging" code. At any point during execution, the entire run may be aborted by entering "STOP."

Re-execution is done by reentering "CALL, RETRIEV." After completing all desired retrievals in a given session, the user can log off by entering "BYE" and then hanging up the phone.

Because all operating commands are built into the system, little or no experience with any form of computing is required to operate the system other than the procedure given in Table 1. Any files that are to be saved by the system for subsequent statistical analyses (e.g., by SPSS) can be stored under the names chosen by the user during the execution of the system. The use of these files, however, will require some knowledge of SPSS and computer operating language. Requested data can be printed automatically on a local line printer.

Our system is currently limited to Boeing EKS (i.e., the system is not designed to interface with other data management systems), although the data base could be transferred en masse to STORET (4) or WATSTORE (5), for example.

SUMMARY AND CONCLUSIONS

A system is described which simplifies the process of retrieving data from computer storage. "Everyday" conversational language forms the basis of communication between data retriever and computer, thereby minimizing the need for specialized training and knowledge in computer operations.

The system allows for relatively easy access to stored data of any kind, and can rapidly generate data tabulations, graphics, and statistical plots and analyses for prompt assessment of water quality or for use in continued aquatic research.

APPENDIX.—REFERENCES

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3. Robinson, B. N., Anderson, G. D., Cohen, E., and Gazdzik, W. F., *SIR (Scientific Information Retrieval) User's Manual*, Northwestern University, Evanston, Ill., 1979.
4. *STORET User Handbook*, 1st ed., Office of Water and Hazardous Materials, United States Environmental Protection Agency, Washington, D.C., 1975.
5. "WATSTORE User's Guide," *Open-File Report 75-426*, United States Geological Survey, Reston, Va., 1975.

APPENDIX III

Inverted microscope method (B-1520-77)

Parameter and code: Phytoplankton, total (cells/ml) 60050

1. Application

The method is suitable for all waters.

2. Summary of method

Taxonomic and numerical assessment of natural populations of phytoplankton require direct microscopic examination. The inverted microscope method permits the observation of the phytoplankton in an aliquot of water at high-power magnification without disrupting or crushing the delicate organisms.

The phytoplankton are concentrated by settling to the bottom of a sample container or a vertical-tube sedimentation apparatus (Utermohl, 1931, 1936, 1958; Lovegrove, 1960). Lund, Kipling, and LeCren (1958) reported that all known algae can be settled.

An aliquot of a phytoplankton sample is poured into a plankton chamber or a sedimentation apparatus. The algae settle onto a microscope cover glass which forms the bottom of the chamber or apparatus, and the settled algae are observed from beneath using an inverted microscope. Because this method permits use of the high dry and oil-immersion objectives on the microscope, very small forms can be identified and enumerated.

3. Interferences

The method is generally free of interferences. Suspended sediment may obscure microorganisms in a sample. Previously used sample bottles and parts of the sedimentation apparatus must be scrubbed thoroughly to remove adherent diatoms and other material, especially from the bottom surfaces. Convection currents and air bubbles in the apparatus can interfere with sedimentation.

4. Apparatus

4.1 *Inverted microscope*, Zeiss Invertoscope D, Nikon (MS-76560), Tiyoda (2020), or equivalent.

4.2 *Ocular micrometer*, Whipple grid, Bausch & Lomb (31-16-13) or equivalent.

4.3 *Plankton chamber*, 26×76 mm glass slide with 12-mm circular hole covered by cementing no. 1½ cover slip to slide.

4.4 *Sedimentation apparatus* of the type described by Lovegrove (1960) (fig. 14), 8-cm high, 25-ml capacity, Scott Instruments, Seattle, Wash., or equivalent. Other sizes may be needed for some types of samples (see 7.3 below).

4.5 *Coverglass*, 22-mm diameter, No. 1 and No. 1½.

4.6 *Rubber cement* for attaching cover glass to the counting chamber.

4.7 *Sample containers*, plastic bottles, 1,000-ml capacity.

4.8 *Water-sampling bottle*, Wildlife Supply Co. (1510 or 1920) (figs. 11 and 12); Scott Instruments, Seattle, Wash., Foerst Mechanical Specialties Co., Improved Water Sampler, Kemmerer-type; or equivalent. Depth-integrated samplers are discussed by Guy and Norman (1970).

4.9 *Cotton swabs*.

4.10 *Vacuum grease*.

4.11 *Pipet*, serological, 1 ml.

4.12 *Balance*, with automatic tare, Sartorius or equivalent.

5. Reagents

5.1 *Cupric sulfate solution*, saturated, dissolve 21 g CuSO₄ in 100 ml distilled water.

5.2 *Formaldehyde-cupric sulfate solution*, mix 1 liter of 40 percent aqueous formaldehyde containing 10–15 percent methanol, Fisher Scientific No. F-78, or equivalent, with 1 ml of solution 5.1.

5.3 *Detergent solution*, 20 percent, dilute 20 ml liquid detergent (Liqui-Nox, Catalog C6308-2, phos-

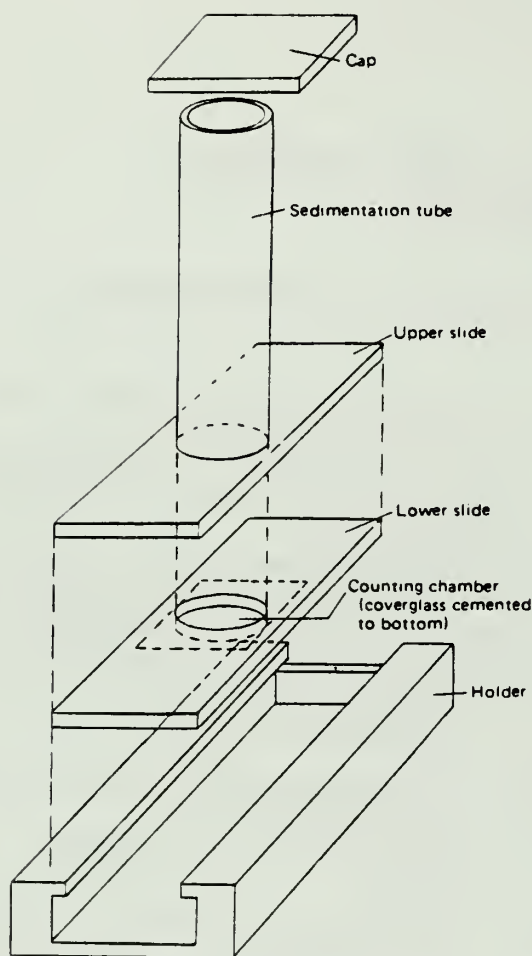


Figure 14.—Sedimentation apparatus. (Modified from Lovegrove, 1960).

phate free, or equivalent) to 100 ml with distilled water.

5.4 Lugol's solution: Dissolve 10 g iodine crystals and 20 g potassium iodide in 200 ml distilled water.

6. Collection

A phytoplankton sample consists of a volume of water, usually 1 liter. To insure maximum correlation of results, the sample sites and methods used for phytoplankton should correspond as closely as possible to those selected for chemical and bacteriological sampling.

The sample collection method will be determined by the study objectives. In lakes, reservoirs, deep rivers, and estuaries, phytoplankton abundance may vary transversely, with depth, and with time of day. To collect a sample representative of the phytoplankton density at a particular depth, use a water-sampling bottle. To collect a sample representative of the entire

flow of a stream, use a depth-integrated sampler (Guy and Norman, 1970; Goerlitz and Brown, 1972). For small streams, a depth-integrated sample or a point sample at a single transverse position located at the centroid of flow may be adequate. Study design, collection, and statistics for streams, rivers, and lakes are described in Federal Working Group on Pest Management (1974).

Preserve sample as follows: To each 1,000 ml of sample add 40 ml of 37–40 percent aqueous formaldehyde solution (100 percent Formalin), 5 ml of 20 percent detergent solution, and 1 ml of cupric sulfate solution. This preservative maintains cell coloration and is effective indefinitely.

Many biologists consider Lugol's solution to be the best plankton preservative. It has been effective for at least 1 year (Weber, 1968); it facilitates sedimentation of cells and maintains fragile cell structures, such as flagella. If Lugol's solution is preferred as a preservative, add 1 ml Lugol's solution to each 100 ml of sample. Store the preserved samples in the dark.

7. Analysis

7.1 If using the sedimentation apparatus (fig. 14), proceed to 7.5. If using the plankton chamber, proceed as follows: If concentration is necessary, allow the sample to settle undisturbed in the sample container for 4 hours per centimeter of depth to be settled. After settling, tare the sample container on an automatic balance.

7.2 Carefully siphon the supernatant to avoid disturbance of the settled material. Place sample container with remaining sample on balance and weigh. The reduction in weight (in grams) is equivalent to the number of milliliters of supernatant removed. The same method can be used to obtain the volume of concentrate.

7.3 Mix the concentrated sample well (but not vigorously) and pipet an appropriate volume into each of two plankton chambers. Slide cover slip into place.

7.4 Place the plankton chamber on the mechanical stage of a calibrated microscope. Proceed to 7.10.

7.5 To prepare the sedimentation apparatus, cement a No. 1 glass cover glass to the bottom of the lower slide to form the bottom of the counting chamber (fig. 14). When dry, remove the excess rubber cement from the inside of the counting chamber with a knife.

7.6 Test for leaks: Coat the underside of the upper slide (fig. 14) with vacuum grease, and press onto the lower slide to form a watertight seal. Assemble the apparatus and fill with distilled water so that the meniscus bulges slightly above the top of the sedimen-

tation tube. Slide the cap over the top to seal the tube. Let stand overnight and check for water loss in the morning.

7.7 If no leaks are detected, thoroughly mix a sample by inverting it at least 40 times, and then fill the sedimentation apparatus and apply the cap as described in 7.2. Allow 4 hours settling time per 1 cm of sedimentation tube length. The volume of sample is dependent on the density of algae. In plankton-poor waters, 100 ml of sample may be required; in more fertile waters, 25 ml or less of sample may be sufficient. The 25 ml volume is most commonly used. The samples may be diluted, if necessary.

Note: Air bubbles on the sides of the chamber tube can be prevented if the water sample and the sedimentation apparatus are at the same temperature when the sample is introduced. The apparatus should be maintained at a constant temperature to avoid convection currents which can interfere with settling.

7.8 After settling, isolate the algae in the counting chamber from the remainder of the apparatus. To separate the sedimentation tube and upper slide from the lower slide and counting chamber (fig. 14), move the sedimentation tube to one side splitting the water column. Remove the tube cap and siphon or pipet off the supernatant. Remove the empty sedimentation tube.

7.9 Remove the lower slide with the counting chamber from the holder (fig. 14). Place the cap over the top of the counting chamber to form a closed cell. If an air bubble remains under the cap, tease it to one side of the chamber and carefully add distilled water to fill the void. Replace the tube cap and put the slide on the inverted microscope.

7.10 Count and identify the total number of algal cells (at $\times 200$ – 300 magnification) in randomly chosen fields. In making the counts, enumerate all forms that intersect two of the borders of the grid, but do not count those that intersect the opposite borders. If a large number of colonies appear within the field, determine the average number of cells in an average size colony and multiply by the number of colonies present. Similarly, tabulate the numbers and lengths of trichomes of blue-green algae in each grid and determine the average number of cells per unit length of trichome. Count all algae containing any part of a protoplast as having been living at the time of collection. Count a minimum of 100 units (unit - one filament, one colony, or one unicellular algae) or 250 fields (at $\times 200$ – 300) whichever is obtained first. For concentrated samples count a minimum of 10 fields.

8. Calculations

$$\frac{(\text{chamber area, mm}^2) \times (\text{number of fields})}{(0.96) \times (\text{field area, mm}^2)} \\ \times (\text{total count}) \\ \times (\text{initial volume, ml}) \\ \times (\text{volume of concentrate, ml}) \\ \times (\text{chamber volume, ml})$$

*Compensates for addition of formaldehyde-detergent preservative.

9. Report

Report phytoplankton concentrations to two significant figures. Report values for each of the three groups: diatoms, green algae, and blue-green algae.

10. Precision

No precision data are available.

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ADDENDUM TO NPS RQ9000-3-0001

TECHNICAL SPECIFICATIONS

Chlorophyll a and pheophytin a analyses will be performed on frozen MF-Millipore filters according to the USEPA-approved procedures in the 15th edition of Standards Methods (APHA-AWWA-WPCF 1981; Section 1002G). To insure adequate recovery of the low chlorophyll a levels previously reported for Crater Lake (Geiger and Larson, 1980) absorbances will be determined using a Gilford model 300N spectrophotometer with a spectral slit width of 8.0 nm. Chlorophyll a reference samples from the USEPA Environmental Monitoring and Support Laboratory at Cincinnati, Ohio will be used to estimate the levels of analytical precision and confidence limits for the analyses. Data from the analyses will be entered on a standard form (Appendix A) and concentrations of chlorophyll a and pheophytin a will be provided in mg/m^3 (or $\mu\text{g/m}^3$).

Phytoplankton samples preserved with Lugol's solution will be analyzed following USEPA-approved procedures for enumeration using an inverted microscope (APHA AWWA WPCF 1981; Section 1002F and Weber 1973, EPA-670/4-73-001, p. 10). A total of 100 individual "units" or particles per sample will be counted. Total unit densities per sample as well as the relative abundance of each species will be calculated. Only "units" with apparent, "healthy" chloroplasts will be counted.

The previous analyses of Crater Lake phytoplankton sampled in a manner similar to the samples to be analyzed showed a predominance of diatoms with occasional chlorophytes and flagellated chrysophytes (Larson and Geiger 1979, Geiger and Larson 1980, and Geiger 1981). A personal taxonomic library comprising references for identifying these species has already been assembled (see selected list of references appended to this addendum). Both phase and SEM photographs have been made of various species for precise identification (see copy of appended 1981 article by Geiger for examples). Documented taxonomic consultation on the identification of unique species has been prepared to assure accurate identifications. Comparisons of individuals with species identified in previous studies of the phytoplankton will be made to insure continuity with earlier identifications. Reference slides from all previous sampling are maintained by the analyst. The rationale for identifications made, in addition to references used, will be provided with the results.

A Wild M-40 inverted microscope will be used for the analyses. Supplemental identification, primarily of diatoms will be made using an AO H20 Phasestar microscope. Sample bottles and remaining phtoplankton samples will be returned following the analyses, to the National Park Service.

| TAXA CODE | TAXA NAME | AUTHORITY | REFERENCE |
|-----------|---------------------------------------|---------------------|------------------------------------|
| A1670 | TRIBONEMA AFFINE | G.S.WEST | Prescott, 1962 |
| A3171 | STEPHANODISCUS HANTZSCHII | GRUN. | Huber-Pestalozzi and Hustedt, 1942 |
| A3850 | FRAGILARIA CONSTRUENS | (EHR.) GRUN. | Patrick and Reimer, 1966 |
| A3879 | FRAGILARIA VAUCHERIAE V. CAPITELLATA | (GRUN.) PATR. | Patrick and Reimer, 1966 |
| A3880 | FRAGILARIA VAUCHERIAE | (KUETZ.) PETERS | Patrick and Reimer, 1966 |
| A4100 | SYNEDRA ACUS | KUETZ. | Patrick and Reimer, 1966 |
| A4101 | SYNEDRA DELICATISSIMA | W. SMITH | Patrick and Reimer, 1966 |
| A4109 | SYNEDRA RUMPENS V. FAMILIARIS | (KUETZ.) HUST. | Patrick and Reimer, 1966 |
| A4140 | SYNEDRA MAZAMAENSIS | SOV. | Patrick and Reimer, 1966 |
| A4380 | ACHNANTHES MINUTISSIMA | KUETZ. | Patrick and Reimer, 1966 |
| A5081 | NAVICULA CRYPTOCEPHALA V. VENETA | (K.) RABH. | Patrick and Reimer, 1966 |
| A5973 | GOMPHONEMA OLIVACEUM V. CALCAREA | CLEVE | Patrick and Reimer, 1966 |
| A6501 | NITZSCHIA SILICA | ARCH. | Patrick and Reimer, 1975 |
| A6510 | NITZSCHIA PALEA | (KUETZ.) W.SMITH | Archibald, 1972 |
| A6531 | NITZSCHIA PERMINUTA | GRUN | Archibald, 1972 |
| A6540 | NITZSCHIA FRUSTULUM | KUETZ. | Archibald, 1972 |
| A6550 | NITZSCHIA LINEARIS | W. SMITH | Archibald, 1972 |
| A6623 | NITZSCHIA BACATA F. LIN. | HUST. | Archibald, 1972 |
| A6690 | NITZSCHIA VERMICULARIS | (KUETZ.) GRUN. | Archibald, 1972 |
| A6760 | NITZSCHIA GRACILIS | HANTZSCH. | Archibald, 1972 |
| A7960 | KEPHYRION SPIRALE | (LACK.) CONRAD | Bourrelly, 1968 |
| A7961 | KEPHYRION ASPER | (LACK.) BOURR. | Bourrelly, 1968 |
| A7987 | CALYCOMONAS SP. | | |
| A8002 | CHROMULINA-LIKE SP. | | |
| A8301 | OCHROMONAS CL1 | | |
| A8304 | OCHROMONAS CL2 | | |
| A8305 | OCHROMONAS CL3 | | |
| A8400 | DINOBRYON SERTULARIA | | |
| A8431 | PSEUDOKEPHYRION ENTZII | EHR. | Prescott, 1962 |
| A9969 | CHRYSOPHYTE STATOSPORE CL2 | CONR. | Bourrelly, 1968 |
| A9977 | CHRYSOPHYTE STATOSPORE CL1 | | |
| C0000* | CHLOROPHYTA UNIDENTIFIABLE | | |
| C1600 | OOCYSTIS PUSILLA | HANSGRG | Prescott, 1962 |
| C1801 | ANKISTRODESMUS FALCATUS V. ACICULARIS | (A.BRAUN) G.S. WEST | Prescott, 1962 |
| C1801 | ANKISTRODESMUS FALCATUS V. SPIRALIS | (TURNER) LEMM. | Prescott, 1962 |
| C2550 | PLANKTOSPHAERIA GLATINOSA | G.M. SMITH | Prescott, 1962 |
| C3000 | SELANASTRUM MINUTUM | (NAEG.) COLL. | Prescott, 1962 |
| C9422 | MOUGEOTIA SP. | | |
| E0000 | CYAROPHYTA UNIDENTIFIABLE | | |
| G0000 | PYRROPHYTA UNIDENTIFIABLE | | |
| G1200 | CRYPTOCHRYYSIS POLYCHRYYSIS | PASCHER | Huber-Pestalozzi, 1968 |
| G1400 | RHODOMONAS MINUTA | SKUJA | Huber-Pestalozzi, 1968 |
| G1401 | RHODOMONAS LACUSTRIS | PASCH. E. RUTT. | Huber-Pestalozzi, 1968 |

*See end of Taxa Code List for more information on C0000

TAXA CODE LIST (CONTINUED)

| TAXA CODE | TAXA NAME | AUTHORITY | REFERENCE |
|-----------|-------------------------|---------------|------------------------|
| G1690 | AMPHIDINIUM LUTEUM | SKUJA | Huber-Pestalozzi, 1968 |
| G1704 | GYMNODINIUM FUSCUM | (E.) STEIN | Huber-Pestalozzi, 1968 |
| G1705 | GYMNODINIUM INVERSUM | NYGAARD | Huber-Pestalozzi, 1968 |
| G2014 | PERIDINIUM INCONSPICUUM | LEMM. | Huber-Pestalozzi, 1968 |
| G2015 | PERIDINIUM ACULIFERUM | (LEMM.) LEMM. | Huber-Pestalozzi, 1968 |

NOTE ON C00000:

The following forms of unidentifiable unicellular green algae were observed. Descriptions of the forms and drawings are found on the data sheets.

C00000: a non-flagellated, spherical cell that stains with IKI around 3 micrometers in diameter.

*C00000: a non-flagellated, spherical cell that does not stain with IKI with IKI; around 2-3 micrometers in diameter.

oC00000: elliptical, rod-shaped cells, probably NANNOCHLORIS SP., 2 micrometers wide by 3 long.

CALCULATION OF UNIT DENSITIES:

The low densities of algae in all samples collected necessitated the concentration of the algae prior to preparing settling chambers for the analysis. The following formula is to be used in calculating unit densities using the Beak settling chambers:

$$\text{Algae units/liter} = \frac{\text{Organisms counted} \times \frac{2.54 \text{ cm}^2}{(0.0133 \text{ cm}^2)} \times \frac{\text{length of transects-cm}}{1 \text{ liter} \times 5 \text{ ml} + \frac{\text{Volume concentrate}}{\text{Volume original sample}}}}{1000 \text{ ml}}$$

* = the area of the settling chamber bottom

+ = the volume used in the settling chamber (generally 5 ml but occasionally 4 ml.

= 100 for all samples counted with the exception of very sparse samples (less than 3 or 4)

φ = width of field at x1500

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LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
130683

SAMPLE IDENTIFICATION

63 QC / Sum

SAMPLING DATE

Day Month Year
010982

PROJECT

D-921

TOTAL SAMPLE TRANSPORT VOLUME

996 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

996:35
 X Y

6 = natural water

7 = concentration of sample (x = original sample volume
 y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

X150 dinoflagellates, no zooplankton
 G2014

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton

☒ Phytoplankton



Phytoplankton

Sample

| | |
|-----------|-----|
| 63 Q C-11 | Dep |
|-----------|-----|

二

Stage Reference

[illegible]

Trans. Reference Points

[illegible]

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|----------|-------|
| A6760 | | 61 | 6 |
| C2010 | | 13 | 3 |
| C0040 | | 3 | 3 |
| A8400 | | III | 4 |
| S1705 | | IIIIIIII | 20 |
| A7987 | | I | 1 |
| C2550 | | IIII | 6 |
| A8205 | | I | 1 |
| A8431 | | I | 1 |

Reviewed by

Data

LABORATORY DATA REPORT PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 3 0 6 8 5

SAMPLE IDENTIFICATION

64 / -10m

SAMPLING DATE

Day Month Year
0 1 0 9 8 2

PROJECT

0 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 0 4 8 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1 0 4 8 : 3 6
 X Y

6 = natural water

7 = concentration of sample (x = original sample volume
 y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 ml

SED. CHAMBER BOTTOM AREA

1 0 0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1 0 0 cm²

NOTES:

X150 numerous dinoflagellates (e.g. G2014)
 no zooplankton

TOTAL UNITS COUNTED

1 1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSG

☒ Periphyton



Phytoplankton

Sample

| | | |
|----|------|-----|
| 64 | -10m | Rep |
|----|------|-----|

Stage Reference

[illegible]

Trans. Reference Points

| | | | | | |
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[illegible][illegible]

Reviewed by

111

Replicate Analysis QC

Page 1 of 2

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
130683

SAMPLE IDENTIFICATION

65 QC / -20m

SAMPLING DATE

Day Month Year
010982

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

974 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

974:33.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

X150 x *dinoflagellate* nucleus (G1704)
or G2015

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton ☒ Phytoplankton

Sample

65 Qc / 20 M Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | | Taxa Name | | Tally | Count |
|-----------|---|-----------|---|-------|-------|-----------|--|-----------|--|-------|-------|
| A | 6 | 7 | 6 | | 4 | | | | | | |
| C | 0 | 7 | 0 | 49 | 2 | | | | | | |
| A | 8 | 7 | 0 | 12 | 1 | | | | | | |
| G | 1 | 7 | 0 | 5 | 5 | | | | | | |
| C | 1 | 8 | 0 | 1 | 10 | | | | | | |
| A | 8 | 3 | 0 | 1 | 8 | | | | | | |
| A | 8 | 2 | 0 | 1 | 3 | | | | | | |
| C | 0 | 0 | 0 | 1 | 1 | | | | | | |

*

Reviewed by

Date

32/Surf

7/29/82

Cutter Salvo

See coversheet
of "Laboratory
Data Report"
for additional
details.

QC

Comparative density and species

#32 7/29/82

Membrane filter method

$$100 \times \frac{2.011 \text{ cm}^2 / .0069 \text{ cm}^2}{.010 \text{ liter}} \times \frac{33}{250} =$$

384,713 units/liter

Settling Chamber Method

$$100 \times \frac{2.54 \text{ cm}^2 / .0148 \text{ cm}^2}{.005 \text{ L}} \times \frac{33}{250} = 453,081 \text{ units/liter}$$

15.1% difference
between estimate
9 density

Replicate analysis 57a QC

Page 1 of 2

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | |
|-----|---|---|-------|---|------|--|
| Day | | | Month | | Year | |
| 1 | 1 | 0 | 6 | 8 | 3 | |

SAMPLE IDENTIFICATION

(57a) 57-10m

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | 0 | 8 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 2 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 3 | : | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 G2014

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Duplicate analysis 576 QC

Page 1 of 2

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
110683

SAMPLE IDENTIFICATION

(576) 57/-10m

SAMPLING DATE

Day Month Year
230882

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

1033 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1033:122
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

x150 - no zoopl.
G 2014

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

11

Phytoplankton

109

Stage Reference

Trans. Reference Points

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C | | 4 | 4 |
| A | | 82 | 82 |
| A | | | 4 |
| A | | | 1 |
| G | | | 2 |
| A | | | 2 |
| A | | | 3 |
| A | | | 2 |

Dre

Re-plankton analysis 57c QC

Page ____ of ____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|-----|-------|------|
| Day | Month | Year |
| | | |

SAMPLE IDENTIFICATION

| | |
|-------|-----------|
| (57c) | (57/-10m) |
|-------|-----------|

SAMPLING DATE

| | | |
|-----|-------|------|
| Day | Month | Year |
| 23 | 08 | 82 |

PROJECT

| | |
|---|------|
| D | 4921 |
|---|------|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 3 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|--|
| 1 | 0 | 3 | 3 | : | 1 | 2 | 3 | |
| | | | | X | Y | | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:



TOTAL UNITS COUNTED

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

MICROSCOPE MAGNIFICATION

| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|

 X

ANALYST

| | | |
|--|--|--|
| | | |
|--|--|--|

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 9 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | |
|---|---|----|
| 8 | / | Sm |
|---|---|----|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 2 | 0 | 9 | 8 | 2 | | | |

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 3 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 3 | 3 | : | | 4 | 3 |
| X | | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 no zooplankton
abundant debris, particulate

990
43

1033



TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

222

Phytoplankton

Sample

Stage Reference

Trans. Reference Points

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C2550 | | I | 1 |
| C0000 | | II | 2 |
| A8400 | | III | 3 |
| A8305 | | I | 1 |
| A9600 | | I | 1 |
| A9975 | | I | 1 |
| S1705 | | II | 2 |
| A6540 | | I | 1 |
| A6760 | | 27 | 27 |

Date _____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
090683

SAMPLE IDENTIFICATION

9/-40m

SAMPLING DATE

Day Month Year
020984

PROJECT

02A21

TOTAL SAMPLE TRANSPORT VOLUME

991 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

991:53
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

4.0 ml



SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:


Bacteria: 


938
50

991

X150

G2015
G1704

zooplankton 

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSIG

① 16.0 (80) — 70.9

☐ Periphyton ☒ Phytoplankton

Sample

| | | | |
|---|---|----|---|
| 9 | - | 10 | m |
|---|---|----|---|

 Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C | 180 | 1 | 9 | 9 | | | | | |
| A | 840 | 0 | | 6 | | | | | |
| C | 180 | 2 | 17 | 17 | | | | | |
| C | 000 | 0 | | 24 | | | | | |
| C | 000 | 0 | | 21 | | | | | |
| A | 662 | 2 | 2 | 2 | | | | | |
| A | 662 | 0 | 1 | 1 | | | | | |
| A | 662 | 0 | 6 | 6 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 2 | | | | | |
| A | 373 | 0 | | 8 | | | | | |
| A | 167 | 0 | 1 | 1 | | | | | |

*

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 9 | 0 | 6 | 2 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 10 | / | -80m |
|----|---|------|

SAMPLING DATE

| | | | | | |
|---|---|---|---|---|---|
| 0 | 2 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 0 | : | 4 | 1 | . | 5 |
|---|---|---|---|---|---|---|---|---|

6 = natural water

7 = concentration of sample (x = original sample volume

y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 numerous plants 9 C9422

$$\begin{array}{r} 989.0 \\ 41.5 \\ \hline 1030.5 \end{array}$$


Heliothrix 2

G1704



Bacteria: 0



TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | |
|---|---|
| N | G |
|---|---|

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
090683

SAMPLE IDENTIFICATION

11 / -100m

SAMPLING DATE
Day Month Year

020982

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

1024 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1024:345
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

• cm²

SED. CHAMBER BOTTOM AREA OBSERVED

• cm²

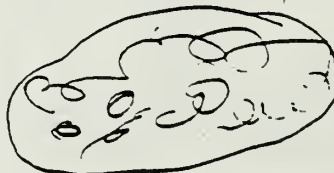
NOTES:

Bacteria: 0

990.0
34.5

1024.5

+150 G1704 alot, detritus debris
zooplankton



Keratella X3
Helicella 1

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 X

ANALYST

NSG



Periphyton



Phytoplankton

Sample

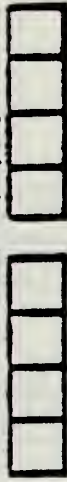
11 / -100m

Rep

Stage Reference



Trans. Reference Points



TAXA COUNTING RECORD

② 16.0 (80) → 73.3

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|---|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C | 2 | 5 | 1 | 1 | | | | | |
| C | 9 | 4 | | 4 | | | | | |
| A | 9 | 9 | | 2 | | | | | |
| C | 1 | 8 | 2 | 2 | | | | | |
| C | 0 | 0 | | 4 | | | | | |
| A | 1 | 6 | | 5 | | | | | |
| G | 1 | 7 | | 6 | | | | | |
| G | 1 | 4 | | 20 | | | | | |
| G | 1 | 2 | | 10 | | | | | |
| C | 0 | 0 | | 19 | | | | | |
| A | 8 | 4 | | 1 | | | | | |
| A | 2 | 1 | | 2 | | | | | |
| C | 1 | 6 | 12 | 2 | | | | | |
| A | 3 | 7 | 1 | 1 | | | | | |
| A | 6 | 5 | 1 | 1 | | | | | |
| G | 1 | 7 | 1 | 1 | | | | | |
| C | 0 | 0 | 12 | 12 | | | | | |
| G | 1 | 6 | 3 | 3 | | | | | |
| C | 1 | 9 | | | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
09 06 83

SAMPLE IDENTIFICATION

12 / -120m

SAMPLING DATE
Day Month Year

02 09 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1035 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1035 : 30
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

X150

G2015

G1704

numerous filaments (9422) (A1670)

Zooplankton



x2

Heredita # x2

barter: sk alveol
fecal pellets



TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton ☒ Phytoplankton

Sample 12/-120m Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| Taxa Code | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|-----------|-----------|-------|-------|
| C0000 | | 34 | 34 | | | | |
| C0002 | | 16 | 16 | | | | |
| A0070 | | | 8 | | | | |
| A0070 | | | 4 | | | | |
| A0070 | | | 1 | | | | |
| A0070 | | | 3 | | | | |
| A0070 | | | 5 | | | | |
| A0070 | | | 6 | | | | |
| A0070 | | | 1 | | | | |
| A0070 | | | 6 | | | | |
| A0070 | | | 6 | | | | |
| A0070 | | | 1 | | | | |
| A0070 | | | 1 | | | | |
| A0070 | | | 1 | | | | |
| A0070 | | | 4 | | | | |
| A0070 | | | 1 | | | | |

* *cover with saline* →

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
11 06 83

SAMPLE IDENTIFICATION

13 / -160m

SAMPLING DATE

Day Month Year
02 09 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1040 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1040 : 30
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

cm²

SED. CHAMBER BOTTOM AREA OBSERVED

cm²

NOTES:


150 zoopl.

mercurius
planis

A1670 ~ C9422

G2015

G1704

bacteria: 



X2

$$\begin{array}{r} 1010 \\ 30 \\ \hline 1040 \end{array}$$

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NS6

11

☐ Periphyton ☒ Phytoplankton

| Sample | Rep |
|--------|-------|
| 13 | -160m |

| Stage | Reference |
|-------|-----------|
| 1 | 2 |
| 2 | 3 |
| 3 | 4 |
| 4 | 5 |
| 5 | 6 |
| 6 | 7 |
| 7 | 8 |
| 8 | 9 |
| 9 | 10 |
| 10 | 11 |
| 11 | 12 |
| 12 | 13 |
| 13 | 14 |
| 14 | 15 |
| 15 | 16 |
| 16 | 17 |
| 17 | 18 |
| 18 | 19 |
| 19 | 20 |
| 20 | 21 |
| 21 | 22 |
| 22 | 23 |
| 23 | 24 |
| 24 | 25 |
| 25 | 26 |
| 26 | 27 |
| 27 | 28 |
| 28 | 29 |
| 29 | 30 |
| 30 | 31 |
| 31 | 32 |
| 32 | 33 |
| 33 | 34 |
| 34 | 35 |
| 35 | 36 |
| 36 | 37 |
| 37 | 38 |
| 38 | 39 |
| 39 | 40 |
| 40 | 41 |
| 41 | 42 |
| 42 | 43 |
| 43 | 44 |
| 44 | 45 |
| 45 | 46 |
| 46 | 47 |
| 47 | 48 |
| 48 | 49 |
| 49 | 50 |
| 50 | 51 |
| 51 | 52 |
| 52 | 53 |
| 53 | 54 |
| 54 | 55 |
| 55 | 56 |
| 56 | 57 |
| 57 | 58 |
| 58 | 59 |
| 59 | 60 |
| 60 | 61 |
| 61 | 62 |
| 62 | 63 |
| 63 | 64 |
| 64 | 65 |
| 65 | 66 |
| 66 | 67 |
| 67 | 68 |
| 68 | 69 |
| 69 | 70 |
| 70 | 71 |
| 71 | 72 |
| 72 | 73 |
| 73 | 74 |
| 74 | 75 |
| 75 | 76 |
| 76 | 77 |
| 77 | 78 |
| 78 | 79 |
| 79 | 80 |
| 80 | 81 |
| 81 | 82 |
| 82 | 83 |
| 83 | 84 |
| 84 | 85 |
| 85 | 86 |
| 86 | 87 |
| 87 | 88 |
| 88 | 89 |
| 89 | 90 |
| 90 | 91 |
| 91 | 92 |
| 92 | 93 |
| 93 | 94 |
| 94 | 95 |
| 95 | 96 |
| 96 | 97 |
| 97 | 98 |
| 98 | 99 |
| 99 | 100 |

| | Trans. Reference Points | | | | | | | |
|--|-------------------------|--|--|--|--|--|--|--|
| | | | | | | | | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C1801 | | 4 | 4 |
| C0000 | | 62 | 62 |
| A3191 | | 10 | 10 |
| A1690 | | 1 | 1 |
| C9422 | | 11 | 2 |
| C1600 | | 6 | 6 |
| A9957 | | 1 | 1 |
| A6760 | | 3 | 3 |
| C1802 | | 1 | 1 |
| C1704 | | 1 | 1 |
| A4701 | | 11 | 2 |
| C0000 | | 11 | 2 |
| A1670 | | 1 | 1 |
| A8400 | | 1 | 1 |
| A3930 | | | |

Reviewed by

010

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
100683

SAMPLE IDENTIFICATION

14 / 200m

SAMPLING DATE
Day Month Year

020982

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

940 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

940 : 135.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

X150



3000
250 ?

filamentous
of A1670 C9422

905.0
35.5

940.5



60000
rare

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

② 16.0 (80) → 70
③ 15.0 (70) → 80
④ 14.0 (80) → 79.5

☐ Periphyton ☒ Phytoplankton

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Sample

| | | | |
|----|---|------|-----|
| 14 | - | 200m | Rep |
|----|---|------|-----|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C1 | 600 | | 21 | 21 | | | | | |
| C1 | 000 | | 39 | 39 | | | | | |
| C1 | 705 | | 11 | 2 | | | | | |
| A1 | 670 | | 1111 | 6 | | | | | |
| A3 | 850 | | 1 | 1 | | | | | |
| A3 | 171 | | 13 | 13 | | | | | |
| A3 | 973 | | 1 | 1 | | | | | |
| G0 | 000 | | 1111 | 4 | | | | | |
| A3 | 730 | | 1 | 1 | | | | | |
| A4 | 101 | | 1 | 1 | | | | | |
| A6 | 632 | | 1 | 1 | | | | | |
| C9 | 422 | | 4 | 4 | | | | | |
| C1 | 840 | | 1 | 1 | | | | | |
| A8 | 431 | | 1 | 1 | | | | | |
| C1 | 802 | | 1 | 1 | | | | | |
| A9 | 669 | | 1 | 1 | | | | | |
| A8 | 700 | | 1 | 1 | | | | | |
| A9 | 977 | | 1 | 1 | | | | | |

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LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 7 | 0 | 6 | 8 | 2 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

P12 / Sm

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

971 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

971 : 53

X
Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

40 ml

SED. CHAMBER BOTTOM AREA

100 cm²

SED. CHAMBER BOTTOM AREA OBSERVED


100 cm²

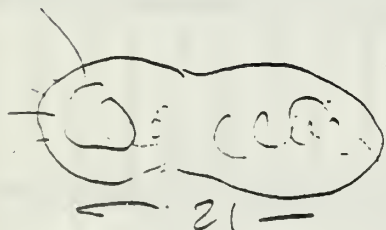
918
 53

 971

NOTES:

curved AG760

 +1

 polozan

no zooplankton at 150x

appears to be abundant debris (organic?) in sample

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 7 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| |
|----------|
| P11/-10m |
|----------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 0 | 2 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 0 | 2 | : | | 4 | 2 |
|---|---|---|---|---|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

$$\begin{array}{r} 960 \\ 42 \\ \hline 1002 \end{array}$$

NOTES:

abundant detritus (organic?)*protozoan (2)**also present but not counted (x150) G1704*

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Periphyton

☒ Phytoplankton

| | | |
|-----|------|--|
| Q11 | -10m | |
|-----|------|--|

Dep

[illegible]

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

[illegible]

•

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
070683

SAMPLE IDENTIFICATION

P10 / -20m

SAMPLING DATE
Day Month Year

010982

PROJECT

D2721

TOTAL SAMPLE TRANSPORT VOLUME

1038 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1038 : 40
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²

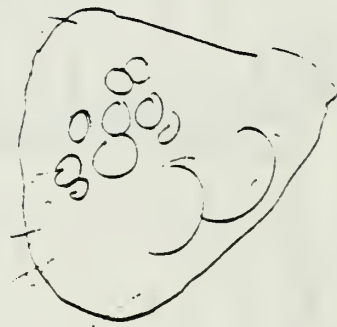
998
40
1038

NOTES:

X150 G1704 frequent — no zooplankton
bacteria S & ctenon 0 rare



protozoan



fecal pellets

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

一一一

Phytoplankton

| |
|--|
| |
| |
| |
| |
| |

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

12

040

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 7 | 0 | 6 | 8 | 5 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| |
|---------|
| P9/-40m |
|---------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 2 | 8 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 2 | 8 | : | 5 | 6 | . | 5 |
|---|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

*bacteria: 0 count**at 150X raw G-2015**polymerase*
$$\begin{array}{r} 972.0 \\ : 56.5 \\ \hline 1028.5 \end{array}$$

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | C |
|---|---|---|

Periphyton

☒ Phytoplankton

| |
|--|
| |
|--|

22



| |
|--|
| |
| |
| |
| |
| |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|--------|-------|
| A8H00 | | 17 | 17 |
| A1670 | | 1 | 1 |
| C1801 | | 11, 12 | 1 |
| C1802 | | 11, 40 | 4 |
| C0000 | | 10 | 10 |
| A6760 | | 1 | 1 |
| C0000 | | 1 | 1 |
| G1704 | | 11 | 2 |
| G1705 | | 11 | 2 |
| A8H31 | | 11 | 2 |
| C0000 | | 11 | 2 |

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
010983

SAMPLE IDENTIFICATION

SAMPLING DATE
Day Month Year
010982

PROJECT
02921

TOTAL SAMPLE TRANSPORT VOLUME
1041 ml

PREPARATION METHOD
7

CONCENTRATION OR DILUTION RATIO
1041:61
X Y

6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME 5.0 ml

SED. CHAMBER BOTTOM AREA 1.0 cm²

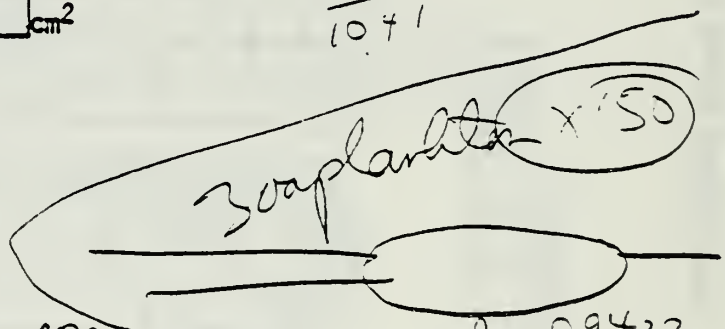
SED. CHAMBER BOTTOM AREA OBSERVED 1.0 cm²

NOTES:

Bacillus β *O. commun*



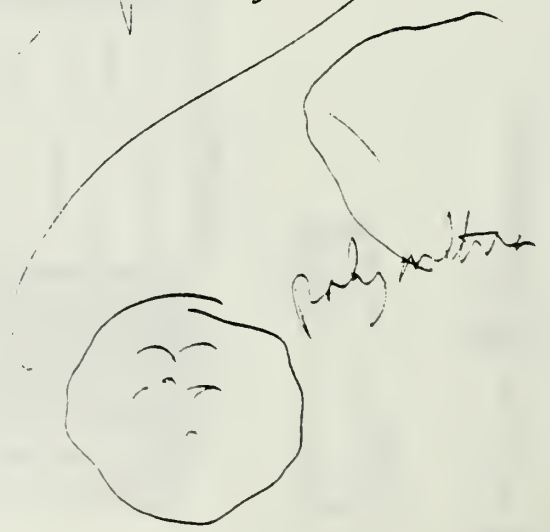
A8304
~~G0000~~
resemble *Cryptomonas* sp.
but no flagella or gullet.
distinctive cell wall not clean
somewhat disrupted
decomposing?



zooplankton x150

also C9422
G1704
G2015

Volvox



Volvox

TOTAL UNITS COUNTED 1100

MICROSCOPE MAGNIFICATION 1500 x

ANALYST NSK



Periphyton



Phytoplankton

Sample

88 / -60m
Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|------|-----------|-------|-------|-----------|-----------|-------|-------|
| A8 | H000 | | 24 | 24 | | | | |
| C1 | 8002 | | 1, 19 | 20 | | | | |
| A1 | 6700 | | 11 | 3 | | | | |
| A8 | 4301 | | 10 | 8 | | | | |
| C0 | 0000 | | 10 | 10 | | | | |
| C1 | 8001 | | 13 | 4 | | | | |
| C1 | 4000 | | 4 | 2 | | | | |
| A3 | 7300 | | 11 | 4 | | | | |
| A8 | 2001 | | 11 | 6 | | | | |
| A6 | 7600 | | 1 | 1 | | | | |
| C0 | 0000 | | 10 | 8 | | | | |
| A8 | 3004 | | 10 | 10 | | | | |

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED 070683

SAMPLE IDENTIFICATION

97/-80m

SAMPLING DATE

010992

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

1030 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1030 : 50

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume

y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

5.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

5.0 cm²

980
50
1030

NOTES:

X150

Bacteria:

65

↑
common

Zooplankton

G1704

C9422


~~60000~~

16 ? A8304


60000
Dino Cyst


TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton ☒ Phytoplankton

TAXA COUNTING RECORD

0.1, 0.1, 0.1 (16.8)

Sample

87/-80m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|---|-----------|-------|-------|-----------|-----------|-------|-------|
| G1200 | 0 | | | 1 | | | | |
| A8000 | 1 | | | 9 | | | | |
| C1400 | 0 | | | 16 | | | | |
| G1400 | 2 | | | 12 | | | | |
| C1800 | 1 | | | 9 | | | | |
| C1800 | 1 | | | 15 | | | | |
| C9422 | 2 | | | 1 | | | | |
| A8000 | 5 | | | 2 | | | | |
| A1600 | 0 | | | 8 | | | | |
| C0000 | 0 | | | 9 | | | | |
| C3000 | 0 | | | 7 | | | | |
| C3000 | 0 | | | 4 | | | | |
| C9000 | 5 | | | 3 | | | | |
| A9000 | 0 | | | 1 | | | | |
| A8000 | 1 | | | 1 | | | | |
| A8000 | 0 | | | 1 | | | | |

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Date

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
070683

SAMPLE IDENTIFICATION

P1-100m

SAMPLING DATE

Day Month Year
010982

PROJECT

D2021

TOTAL SAMPLE TRANSPORT VOLUME

1038 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1038 : 48
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

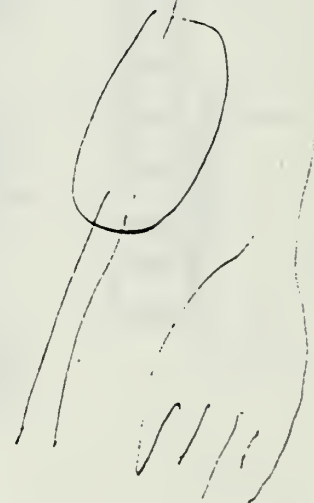
. cm²

NOTES:

x150

C9422 ← canon
G1704

990
48
1038



TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500

ANALYST

NSIG

☐ Periphyton ☒ Phytoplankton

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Sample P1/-100m² Rep

| Taxa Code | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|-----------|-----------|-------|-------|
| C0000 | | 50 | 50 | | | | |
| C1802 | | 13 | 13 | | | | |
| G1400 | | 6 | 6 | | | | |
| C9422 | | 11 | 11 | | | | |
| A8431 | | 111 | 111 | | | | |
| A8201 | | 11 | 11 | | | | |
| A1670 | | 11 | 11 | | | | |
| G1705 | | 9 | 9 | | | | |
| C1800 | | 111 | 111 | | | | |
| A6760 | | 1 | 1 | | | | |
| G1200 | | 1 | 1 | | | | |
| A8305 | | 11 | 11 | | | | |
| A6540 | | 11 | 11 | | | | |
| C3000 | | | | | | | |

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 7 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| P2 | - | 120m |
|----|---|------|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 1 | 0 | 9 | 8 | 3 | | | |

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 6 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 6 | : | 4 | 1 | 5 |
| X | | | | | Y | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

*Bacteria. S. common**zooplankton x150**Peritella
G-1704*

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

$$\begin{array}{r} 41.5 \\ 995.0 \\ \hline 1036.5 \end{array}$$



Periphyton



Phytoplankton

Sample

82/-120m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C1 | 801 | | 7 | 7 | | | | | |
| A1 | 670 | | | 9 | | | | | |
| C0 | 000 | | 41-1 | 40 | | | | | |
| C1 | 802 | | 17 | 17 | | | | | |
| C0 | 000 | | | 4 | | | | | |
| C3 | 000 | | | 1 | | | | | |
| C9 | 422 | | | 5 | | | | | |
| G1 | 400 | | | 11 | | | | | |
| A4 | 101 | | | 2 | | | | | |
| C1 | 200 | | | 2 | | | | | |
| C0 | 000 | | | 1 | | | | | |
| G1 | 705 | | | 1 | | | | | |

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 8 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| |
|----------|
| P3/-140m |
|----------|

SAMPLING DATE

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 5 | : | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²


SED. CHAMBER BOTTOM AREA OBSERVED


| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 G2015
G1704

 egg?
numerous filaments
9 C9422 and A1670

bacteria, 


fecal pellet

$$\begin{array}{r} 10005 \\ 34.5 \\ \hline 1035.0 \end{array}$$

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|



Periphyton



Phytoplankton

Sample

P3/-140m
Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|--------|-------|-----------|--|-----------|-------|-------|
| C0 | 000 | | 62 | 62 | | | | | |
| C1 | 800 | | 10 | 10 | | | | | |
| C1 | 800 | | 7 | 7 | | | | | |
| A3 | 171 | | 11, 6 | 9 | | | | | |
| A4 | 101 | | 11 | 2 | | | | | |
| A1 | 670 | | 1 | 1 | | | | | |
| G1 | 705 | | 11 | 2 | | | | | |
| C0 | 000 | | 11, 11 | 5 | | | | | |
| C9 | 422 | | 11 | 3 | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
080683

SAMPLE IDENTIFICATION

P4 / -160m

SAMPLING DATE

Day Month Year
010982

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1012 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1012:26.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²


SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:


X150 G1704/G-2015

Small feed pellets 66-25

Zooplankton

985
26.5

1011.5

saw cell feed inside that pellet was colored as granules like this green algae (6 µm d)

Bacteria: there are many bacteria? coccoid
<0.5 µm also a few 

P4 C0000



NOTE: saw chloroplast in A4101 that resembled C0000. The frustules were coming apart.

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

11500 x

ANALYST

NLSG

一一一



Phytoplankton

PH - 160m

Stage Reference

Trans. Reference Points

Tally

Taxa Name

Java Code

font

Tally

21

•

24

0

Reviewed by

Dr.

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 8 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| |
|----------|
| PS/-180m |
|----------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 0 | 0 | : | | 4 | 4 |
|---|---|---|---|---|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 4 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

$$\frac{1000}{44} = 1044$$

NOTES:

X150 G1704, G2015 - no zooplankton.

fecal pellets

small 20-30 μ mA0000  rare?

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 8 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | 6 | / | - | 2 | 0 | 0 | m |
|---|---|---|---|---|---|---|---|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 2 | 7 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 2 | 7 | : | | 4 | 7 |
|---|---|---|---|---|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

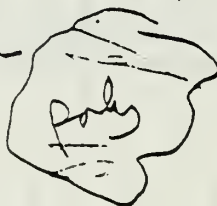
NOTES:

$$\begin{array}{r} 780 \\ 47 \\ \hline 1027 \end{array}$$
bacteria. 0.5 μ m / 0 / 0 / 8

fecal pellet

broken frustule (A3730,

X150 zooplankton

G-1704
G-2015

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Sample


96/-200m

22

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points



Count

Tally

Taxa Name

Taxa Code

Count

Ally

Taxa Name

Taxa Code

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C0000 | | 74 | 74 |
| A3170 | | 2-1 | 2 |
| C1890 | | 2 | 2 |
| A6690 | | 1 | 1 |
| A9977 | | 1 | 1 |
| A5081 | | 1 | 1 |
| A6760 | | 1 | 1 |
| C3000 | | 1 | 1 |
| A1670 | | 1 | 1 |
| C1801 | | 6 | 6 |
| A3730 | | 11 | 3 |
| A4101 | | 1 | 1 |
| C9422 | | 1 | 1 |

Reviewed by

Date _____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 3 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | | |
|----|---|----|--|
| 63 | / | Sm | |
|----|---|----|--|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|--|---|---|---|
| | 9 | 9 | 6 |
|--|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 9 | 9 | 6 | : | | 3 | 5 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 dinoflagellates abundant
no zooplankton

A6760 curved perid
4,

| |
|-----|
| 961 |
| 35 |
| 996 |


Protophytes

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | J | C |
|---|---|---|



Periphyton



Phytoplankton

Sample

63/Sud Rep

Stage Reference

Stage Reference grid

Trans. Reference Points

Trans. Reference Points grid

Main data table with columns: Taxa Code, Taxa Name, Tally, Count, Taxa Code, Taxa Name, Tally, Count

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 8 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

64/-10m

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 2 | 2 |
|---|---|---|---|---|---|

PROJECT

D29-1

TOTAL SAMPLE TRANSPORT VOLUME

1048 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1048 : 56
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

1012
36

1048

Curved Nitzschia
clundet A6760

X150 G1704



explanator
pore

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSIG



Periphyton

Phytoplankton

Sample

| | | |
|----|-----|---|
| 64 | -10 | W |
|----|-----|---|

12

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

[illegible]

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|---------|-------|
| C | 000 | 11 | 2 |
| A | 007 | 77 | 7 |
| A | 030 | 111 | 4 |
| G | 170 | 13 | 4 |
| G | 201 | 1 | 1 |
| A | 840 | 1111111 | 10 |
| C | 000 | 1 | 1 |

Reviewed by

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | |
|----------------|---|----|
| Day Month Year | | |
| 0 | 8 | 06 |
| 8 | 3 | |

SAMPLE IDENTIFICATION

| | |
|----|------|
| 65 | -20m |
|----|------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | |
|---|---|---|
| 9 | 7 | 4 |
|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 7 | 4 | : | 3 | 3 | . | 5 |
| X | | | | Y | | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

X150 abundant Q1704

no zooplankton seen

bacteria: 80 fecal pellets

$$\begin{array}{r}
 974.0 \\
 33.5 \\
 \hline
 973.5
 \end{array}$$

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

$$|c| \rightarrow 0, \sigma \rightarrow 0$$

| | |
|-------------------------------------|---------------|
| <input type="checkbox"/> | Periphyton |
| <input checked="" type="checkbox"/> | Phytoplankton |

| Sample | Rep |
|---------|-----|
| 65/-20m | |

Stage Reference

Trans. Reference Points

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|----------------|-------|
| A6760 | | 29 | 29 |
| C1801 | | 116 | 117 |
| A8205 | | 111 | 110 |
| A1970 | | 1 | 1 |
| G1970 | | 111 | 3 |
| A8431 | | 11 | 2 |
| G1970 | | 111 | 3 |
| C1802 | | 11 | 2 |
| C0000 | | 14 | 5 |
| A8201 | | 1 | 1 |
| A8400 | | 17 | 17 |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
080683

SAMPLE IDENTIFICATION

661-40m

SAMPLING DATE

Day Month Year
010982

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

1049 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1049:42
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml



SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

Bacteria  common 
not
o c o o o o
becomes granular

1007
42

1049

X150

zooglenites
G1704
common



scarce

Presence of so many
Bacteria may indicate
sample was not well
preserved or was
being held in
Active!!

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

Phytoplankton

129

| | |
|--|--|
| | |
| | |
| | |
| | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| 310000 | | 16 | 7 |
| 310000 | | 11 | 4 |
| 310000 | | 11 | 3 |
| 310000 | | 11 | 9 |
| 310000 | | 11 | 3 |
| 310000 | | 11 | 2 |
| 310000 | | 11 | 3 |
| 310000 | | 11 | 7 |
| 310000 | | 11 | 4 |
| 310000 | | 11 | 3 |
| 310000 | | 11 | 2 |
| 310000 | | 11 | 1 |
| 310000 | | 11 | 1 |
| 310000 | | 11 | 10 |

210

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 9 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|-------|
| 67 | / | -60 m |
|----|---|-------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 3 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 4 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 4 | : | 3 | 4 | : | 5 |
|---|---|---|---|---|---|---|---|---|

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | |
|---|---|---|
| 5 | . | 0 |
|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | |
|---|---|---|---|---|
| 1 | . | 1 | 1 | 1 |
|---|---|---|---|---|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | |
|---|---|---|---|---|
| 1 | . | 1 | 1 | 1 |
|---|---|---|---|---|

 cm²

NOTES:

X150


G1704
G2015

1000.0
34.5
1034.5

numerous
bacteria: 0 0 0 common

67 0000
light green?

TOTAL UNITS COUNTED

| | | | |
|---|---|---|---|
| 1 | 1 | 0 | 0 |
|---|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

NSC



1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 25

Trans. Reference Points

| Sample | Rep |
|--------|-----|
| 67-60m | |

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

[illegible]

Tally

Taxa Name

Java code

3

三

[illegible]

Reviewed by

Date _____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 9 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | | |
|----|---|----|---|
| 68 | - | 80 | m |
|----|---|----|---|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 1 | 0 | 9 | 2 | 2 | | | |

PROJECT

| | | | | | |
|---|---|---|---|--|--|
| D | 2 | A | - | | |
|---|---|---|---|--|--|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | | |
|---|---|---|---|---|---|--|--|--|--|
| 1 | 0 | 4 | 0 | : | | | | | |
| X | | | | | Y | | | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

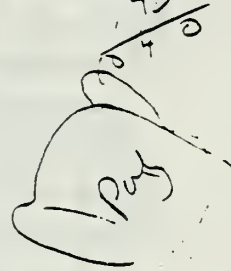
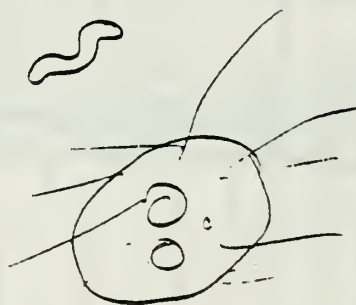
| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

Filing 3-4)
X150 Kellicott
C9422
G2015

Surrella

997
43
240bacteria numerous: 3 0 5
fecal pellets

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | L |
|---|---|---|

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 9 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

69/-100m

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1043 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1043 : 4502
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

4.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

998.0
45.2

1043.2

Bacteria: ?

A6760 curved (some)

69C0000



all dead
Golden
C0000?

C2550



X150

Filina
G1704
Keratella



TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 X

ANALYST

NSG



Periphyton



Phytoplankton

Sample

69/-100m
Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|------|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C | 1802 | | 25 | 23 | | | | | |
| C | 1000 | | 30 | 30 | | | | | |
| A | 305 | | 1 | 1 | | | | | |
| A | 301 | | 1 | 5 | | | | | |
| C | 1000 | | 1 | 2 | | | | | |
| C | 1801 | | 8 | 8 | | | | | |
| C | 1400 | | 1 | 7 | | | | | |
| A | 606 | | 1 | 3 | | | | | |
| A | 643 | | 1 | 6 | | | | | |
| C | 0000 | | 1 | 1 | | | | | |
| C | 0000 | | 1 | 2 | | | | | |
| C | 1705 | | 1 | 1 | | | | | |
| A | 1400 | | 1 | 1 | | | | | |
| A | 1200 | | 1 | 1 | | | | | |
| A | 1670 | | 1 | 1 | | | | | |
| A | 0000 | | 1 | 5 | | | | | |
| A | 254 | | 1 | 1 | | | | | |
| A | 314 | | 1 | 1 | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
090692

SAMPLE IDENTIFICATION

70/120m

SAMPLING DATE

Day Month Year
010982

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1042 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1042 : 42
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²

NOTES:



X150 *planets* A167000 C9422
minerals

A1704
Zooplankton
Peritella



1000
42

7042

Eastern  
fecal pellet



TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 X

ANALYST

NSG

Periphyton

☒ Phytoplankton

| Sample | Rep |
|----------|-----|
| ND/-120m | |

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

[illegible]

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C0000 | | 57 | 57 |
| C0400 | | 1 | 1 |
| C0800 | | 19 | 19 |
| C0801 | | III | 3 |
| A3171 | | IIII | 4 |
| C0000 | | II | 2 |
| G1400 | | I | 1 |
| A8201 | | I | 1 |
| A9977 | | I | 1 |
| A1670 | | | |

Reviewed by

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 9 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|-------|
| 71 | / | -140m |
|----|---|-------|

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | A | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 4 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 0 | 4 | 4 | : | 6 | 5 |
|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

feed pellet

X 150

G1704
G2015



2-3

$$\begin{array}{r} 1000.0 \\ 43.5 \\ \hline 1043.5 \end{array}$$

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

1

Phytoplankton ☒

Periphyton ☐

| Sample | Rep |
|---------|-----|
| 71-140m | |

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C | | 6 | 6 |
| A | | 4 | 4 |
| C | | 5 | 5 |
| A | | 8 | 8 |
| C | | 9 | 9 |
| A | | 2 | 2 |
| A | | 1 | 1 |
| A | | 2 | 2 |
| A | | 1 | 1 |
| A | | 1 | 1 |

Reviewed by

101

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
09 06 83

SAMPLE IDENTIFICATION

72 / -160m

SAMPLING DATE

Day Month Year
01 09 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1035 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1035 : 35.2
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²

NOTES:

X150



zoopl.

C9422
G1704
G2015

$$\frac{1000.0}{35.2} = 1035.2$$



eggs?

fecal pellets (8-10 transect)
very little bacteria

bacteria: ~~none~~

20000 ← chloroplast, A4101

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG



Periphyton



Phytoplankton

Sample

72/-160m
Rep

Stage Reference

☐☐☐☐☐☐

Trans. Reference Points

☐☐☐☐☐☐☐☐☐☐☐☐

TAXA COUNTING RECORD

① 16.0 (10.0 → 70)
② 16.0 (80 → 70)
③ 15.0 (70. → 75.1)

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|--------|-----------|-----------------|-------|-----------|--|-----------|-------|-------|
| * 2 | C00000 | | 59 | 59 | | | | | |
| | C00000 | | | | | | | | |
| | A16704 | | | 7 | | | | | |
| | G17042 | | | 13 | | | | | |
| | C96760 | | | 2 | | | | | |
| | A18001 | | | 4 | | | | | |
| | C18003 | | | 1 | | | | | |
| | A66331 | | | 16 | | | | | |
| | A31705 | | | 1 | | | | | |
| | A37777 | | | 2 | | | | | |
| | A99777 | | | 1 | | | | | |
| | A41011 | | | 1 | | | | | |
| | A66990 | | | 1 | | | | | |

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
09 06 83

SAMPLE IDENTIFICATION

73/-180m

SAMPLING DATE

Day Month Year
01 09 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1023 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1023: 48
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml


SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

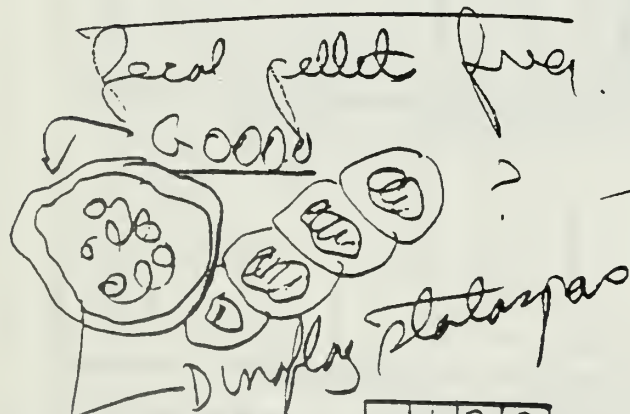
. cm²

NOTES:

x150 a few filamentous C9422
300x lighter
G1704 ac. 

975
48

1023



TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSIG



☐ Periphyton ☒ Phytoplankton

② 16.0 (80 → 70)
 ③ 15.0 (70 → 60)
 ④ 14.0 (60 → 76.1)

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Sample

| | |
|---------|-----|
| 73/-80m | Rep |
|---------|-----|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|---|-----------|------------------|-------|-----------|--|-----------|-------|-------|
| C00000 | 0 | | 56 | 56 | | | | | |
| A1670 | 0 | | | 10 | | | | | |
| A4101 | 1 | | | 2 | | | | | |
| A9969 | 2 | | | 1 | | | | | |
| C1801 | 1 | | 5 | 5 | | | | | |
| C1801 | 1 | | 6 | 6 | | | | | |
| A3171 | 0 | | | 11 | | | | | |
| A6969 | 5 | | | 2 | | | | | |
| A9422 | 2 | | | 2 | | | | | |
| A6690 | 0 | | | 1 | | | | | |
| C0000 | 0 | | | | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

 Day Month Year

SAMPLE IDENTIFICATION

| |
|-----------|
| 74/-200 m |
|-----------|

SAMPLING DATE

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 0 | 9 | 8 | 2 |
|---|---|---|---|---|---|

 Day Month Year

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 7 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 3 | 7 | : | | 4 | 7 |
|---|---|---|---|---|--|---|---|

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

few pellets 10-15/totals

990
47

1037

X150

G1704

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|



Periphyton



Phytoplankton

Sample

74/-200m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

(2) 16.0 (80 → 70)
(3) 15.0 (70 → 73.1)

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|---|-----------|-----------------|-------|-----------|--|-----------|-------|-------|
| C0000 | 0 | | 64 | 64 | | | | | |
| A3171 | 1 | | 13 | 13 | | | | | |
| A8301 | 1 | | | 5 | | | | | |
| A1670 | 0 | | | 6 | | | | | |
| A9977 | 7 | | | 2 | | | | | |
| A2730 | 2 | | | 3 | | | | | |
| C1802 | 2 | | | 2 | | | | | |
| A9969 | 9 | | | 1 | | | | | |
| A6632 | 2 | | | 1 | | | | | |
| C9422 | 2 | | | 1 | | | | | |
| A6690 | 0 | | | 1 | | | | | |
| A6760 | 0 | | | 1 | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|-----|-------|------|
| Day | Month | Year |
| 24 | 05 | 83 |

SAMPLE IDENTIFICATION

| |
|--------|
| 55/Sun |
|--------|

SAMPLING DATE

| | | |
|-----|-------|------|
| Day | Month | Year |
| 23 | 08 | 82 |

PROJECT

| |
|-------|
| 02721 |
|-------|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 3 | 3 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume

y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

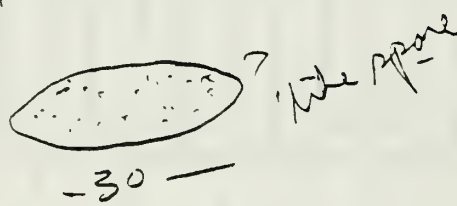
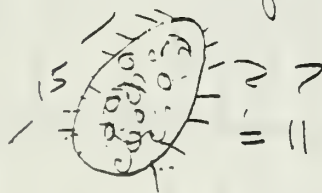
725
250

475

NOTES:



are
G1705 appeared to be
enlarged - thicker covering, not
well defined pulcus



No zooplankton
seen x150

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | C |
|---|---|---|

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED 23 05 83
Day Month Year

SAMPLE IDENTIFICATION

57 -10m

SAMPLING DATE

23 08 82
Day Month Year

PROJECT

029-1

TOTAL SAMPLE TRANSPORT VOLUME

1033 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1033 : 123
X Y

6 = natural water

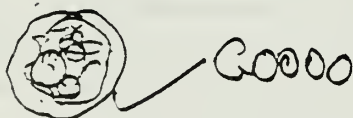
7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME 5.0 mlSED. CHAMBER BOTTOM AREA 1.0 cm²SED. CHAMBER BOTTOM AREA OBSERVED 1.0 cm²

$$\begin{array}{r} 0.10 \\ 123 \\ \hline 1033 \end{array}$$

NOTES:



Trachea



TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

Periphyton ☐ Phytoplankton ☒

Sample

57-1011

Asp

Stage Reference

| |
|--|
| |
| |
| |
| |
| |
| |

Trans. Reference Points

| | |
|--|--|
| | |
| | |
| | |
| | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| A6 | 76 | 76 | 76 |
| C1 | 80 | 11 | 2 |
| A5 | 90 | 11 | 3 |
| C0 | 00 | 15 | 6 |
| A8 | 00 | 11111 | 8 |
| G0 | 00 | 1 | 1 |
| C1 | 50 | 1 | 1 |
| A3 | 80 | 1 | 1 |
| A2 | 20 | 1 | 1 |
| A2 | 31 | 1 | 1 |

Reviewed by

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 2 | 3 | 0 | 5 | 8 | 2 | | | |

SAMPLE IDENTIFICATION

| | | |
|----|---|-------|
| 58 | / | -20 m |
|----|---|-------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | 0 | 8 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 7 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1 | 0 | 4 | 7 | : | | 5 | 9 |
| X | | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²978
59
1037

NOTES:

bacteria = 8 common

J

Also saw

Gymnodinium
fuscumno zooplankton
seen at x150

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

☐ Periphyton ☒ Phytoplankton

Sample

58/-20m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count | | |
|-----------|---|-----------|-------|-------|-----------|---|-----------|-------|-------|---|---|
| C | Q | Q | Q | Q | 0 | C | Q | Q | Q | 0 | |
| A | 8 | 4 | 0 | 0 | 1 | C | A | 8 | 4 | 0 | 0 |
| C | 1 | 8 | 0 | 1 | 5 | C | 1 | 8 | 0 | 1 | 5 |
| C | 1 | 7 | 0 | 2 | 2 | C | 1 | 7 | 0 | 2 | 2 |
| A | 8 | 4 | 3 | 1 | 0 | C | A | 8 | 4 | 3 | 1 |
| C | Q | Q | Q | Q | 0 | C | Q | Q | Q | Q | 0 |
| G | 1 | 4 | 0 | 0 | 1 | G | 1 | 4 | 0 | 0 | 1 |
| A | 8 | 3 | 0 | 1 | 6 | A | 8 | 3 | 0 | 1 | 6 |
| A | 6 | 7 | 6 | 0 | 6 | A | 6 | 7 | 6 | 0 | 6 |

Reviewed by

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
230583

SAMPLE IDENTIFICATION

59/-40m

SAMPLING DATE

Day Month Year
230882

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1030 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1030 : 77
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

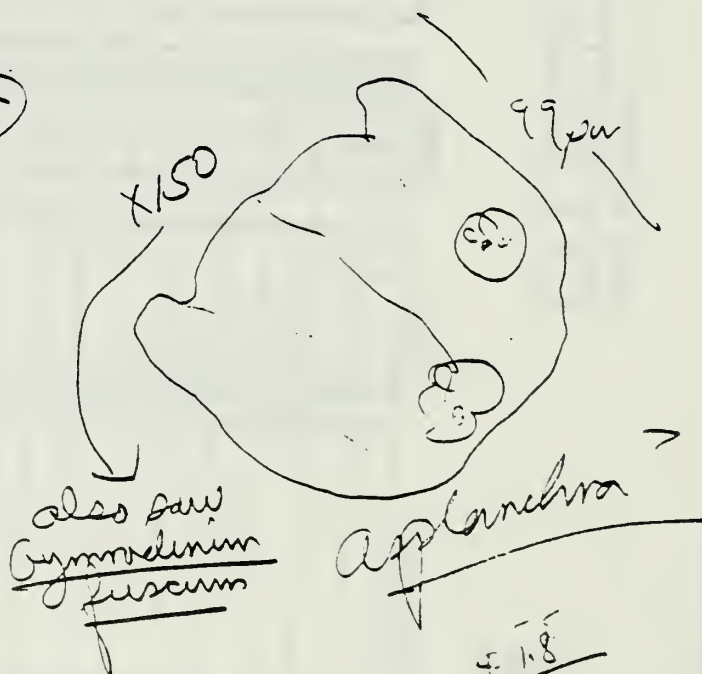
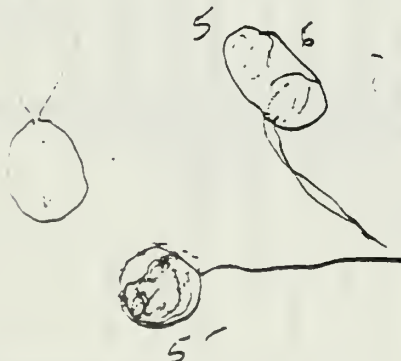
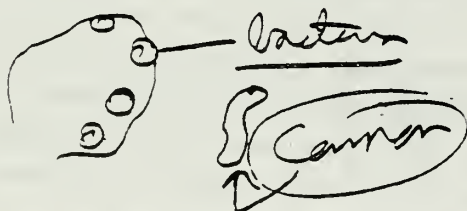
SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:



953
77

1030

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

5.18
443

5.18



Periphyton



Phytoplankton

Sample

59/-40m
Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-------|-----------|----------|-------|-----------|--|-----------|-------|-------|
| C | 00000 | | 28 | 28 | | | | | |
| C | 00000 | | 7 | 7 | | | | | |
| A | 8431 | | IIIIII | 10 | | | | | |
| A | 8431 | | IIII | 4 | | | | | |
| C | 1802 | | IIII(22) | 25 | | | | | |
| A | 1670 | | IIII | 7 | | | | | |
| G | 1704 | | 1 | 1 | | | | | |
| G | 1801 | | (II)II | 4 | | | | | |
| G | 1400 | | 1 | 1 | | | | | |
| C | 00000 | | 1 | 1 | | | | | |
| A | 8301 | | 1 | 1 | | | | | |
| G | 1702 | | 1 | 1 | | | | | |

*

o

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 6 | 0 | 6 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | | |
|----|---|---|-----|
| 67 | / | - | 60m |
|----|---|---|-----|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | 0 | 8 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 5 | 3 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|--|---|---|--|
| 1 | 0 | 5 | 3 | : | | 4 | : | |
|---|---|---|---|---|--|---|---|--|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume

y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

1.7 ml x 3-5 hrs.

20000 = ~~20000~~ 20000Present but
not countedG1400, A8400, C1801, A1670
also present G1704, G2015.these could
be bacteria10¹²
41
1053good preserved
sample?

Zooplankton



TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|



Phytoplankton

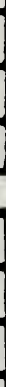
Sample

| | |
|----------|-----|
| 6.7/-60m | Rep |
|----------|-----|

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

[illegible]

Reviewed by

Date _____

1311 East 9th Ave

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
06 06 83

SAMPLE IDENTIFICATION

49 / -80 m

SAMPLING DATE
Day Month Year

23 08 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1015 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1015 : 41.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED


1.0 cm²

NOTES:

bacteria:  (common)

773.0
41.5

1014.5

 7-8

|||| (did not count)

 9

Spore
60000

also present

G1704

~~Zooplankton~~

~~algae~~

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton ☒ Phytoplankton

Sample

49 / -80m Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|-----------------|-------|-----------|--|-----------|-------|-------|
| C1 | 800 | | | 13 | | | | | |
| C1 | 801 | | | 11 | | | | | |
| C1 | 400 | | | 8 | | | | | |
| C1 | 000 | | | 8 | | | | | |
| C1 | 000 | | | 15 | | | | | |
| C1 | 000 | | | 15 | | | | | |
| A1 | 670 | | | 11 | | | | | |
| A1 | 870 | | | 9 | | | | | |
| A1 | 510 | | | 13 | | | | | |
| A1 | 430 | | | 8 | | | | | |
| G1 | 000 | | | 2 | | | | | |
| A1 | 730 | | | 1 | | | | | |
| G1 | 705 | | | 1 | | | | | |

*

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED 060683
Day Month Year

SAMPLE IDENTIFICATION

50/-100m

SAMPLING DATE

Day Month Year

230882

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1034 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1034 : 38.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

3.5 ml

SED. CHAMBER BOTTOM AREA

1.5 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.5 cm²

NOTES:

°C0000 — numerous (unpreserved sample — bacteria?)
Saw at 60m

also present

A1620, C9422, A1200, A1400,
A8400,

zooplankton

TOTAL UNITS COUNTED


100

MICROSCOPE MAGNIFICATION


1500 x

ANALYST

NSG



Phytoplankton



Phytoplankton

Sample

| | |
|----|-------|
| 50 | -100m |
|----|-------|

द्वे

Stage Reference

[illegible]

Trans. Reference Points

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |

[illegible]

Reviewed by

Date _____

1

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
060683

SAMPLE IDENTIFICATION

51/-100m

SAMPLING DATE
Day Month Year

230882

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1030 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1030:47.7
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

47.7
982.0

1029.7

COOOO = numerous.

same as at -60m as
prevous. (unpreserved sample)
was not straw colored
when brought in

present but
not counted:

C1802, A3171, C9422,
G1400, A1670, G1204

Zooplankton

TOTAL UNITS COUNTED

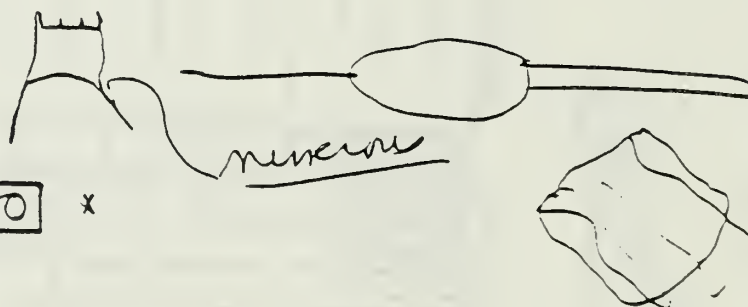
1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSIG



Phytoplankton

Data

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

SAMPLE IDENTIFICATION

| | | |
|----|---|-------|
| 52 | - | 140 m |
|----|---|-------|

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 3 | 0 | 8 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 3 | 5 | : | 4 | 6 | 0 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

C0000 =

c9422

numerous on filament

looks like bacteria

many filament covered also displays like cover 20

G1704

A0000

zooplankton

UNPRESERVED SAMPLE!

not algae like?

TOTAL UNITS COUNTED

| | | | |
|--|--|---|---|
| | | 2 | 5 |
|--|--|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

NIG

Q? How produce so many bacteria? what is the substrate dissolved organics

Phytoplankton

Stage Reference

| |
|--|
| |
| |
| |
| |
| |

Sample

| | |
|---------|-----|
| 52/140m | Rep |
|---------|-----|

Trans. Reference Points

| | | | | | | | |
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| | | | | | | | |

Count

Tally

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Taxa Code

| | | | | |
|---|---|---|---|---|
| A | 3 | 1 | 5 | 1 |
| C | 9 | 4 | 2 | 2 |
| C | 0 | 0 | 0 | 0 |
| C | 0 | 0 | 0 | 0 |
| A | 6 | 6 | 9 | 0 |
| C | 0 | 0 | 0 | 0 |
| C | 1 | 8 | 0 | 1 |
| G | 1 | 5 | 0 | 4 |
| A | 1 | 6 | 5 | 0 |
| A | 3 | 5 | 3 | 0 |

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Data

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

SAMPLE IDENTIFICATION

53 / -160m

SAMPLING DATE

Day Month Year

23 09 82

PROJECT

D 20-2

TOTAL SAMPLE TRANSPORT VOLUME

1031 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1037 : 462
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

bacteria: *R*
"O O O O O" - numerous

feed pellets

SAMPLE NOT
PRESERVED

counted a few
then stopped

TOTAL UNITS COUNTED

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSIG

46.2
985.0
1031.2

Periphyton

Phytoplankton

| | |
|----|-------|
| 53 | -160m |
|----|-------|

Stage Reference

| |
|--|
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| |

Trans. Reference Points



| |
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[illegible]

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Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

06 06 83

SAMPLE IDENTIFICATION

54/-180m

SAMPLING DATE
Day Month Year

23 08 82

PROJECT

0292

TOTAL SAMPLE TRANSPORT VOLUME

1036 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1036 : 40.5

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

cm²

SED. CHAMBER BOTTOM AREA OBSERVED

cm²

NOTES:

$$\begin{array}{r} 40.5 \\ 99.50 \\ \hline 1035.5 \end{array}$$

2- (Amels) fecal pellet common 6-7 / transect
 NO BACTERIA COOOO!
 AOOOO 11

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

Periphyton

Phytoplankton



Periphyton

(2) 5.0 (80) 11.5
(2) 4.0 (80) 7.5

(2) 5.0 (80) 11.5
(2) 4.0 (80) 7.5

Stage Reference

[illegible]

Trans. Reference Points

| | |
|--|--|
| | |
| | |
| | |
| | |

Sample

| | | |
|----|-------|-----|
| 54 | -180m | Rep |
|----|-------|-----|

229

Count

July

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Taxa Code

②

| Taxa Code | Taxa Name | Tally | Count | Taxa Code | Taxa Name |
|-----------|-----------|-------|-------|-----------|-----------|
| C0000 | | 67 | 6 | 7 | |
| C0802 | | 1 | 2 | 2 | |
| A3500 | | 11 | 3 | 3 | |
| C1801 | | 11 | 2 | 2 | |
| C1900 | | 11 | 1 | 7 | |
| A1650 | | 11 | 3 | 3 | |
| A3151 | | 1 | 1 | 1 | |
| A6690 | | 11 | 2 | 2 | |
| A2900 | | 1 | 1 | 1 | |
| A4101 | | | | | |

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Date _____

Example 10

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 1 | 9 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|----|
| 25 | / | Sm |
|----|---|----|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 5 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 2 | 3 | . | 5 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | | |
|--|--|---|---|--|--|
| | | 4 | . | | |
|--|--|---|---|--|--|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

250
800

1050

NOTES:

* 10000 spheres, slip, unwell non-flag, non down
No zooplankton seen x100

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | K |
|---|---|---|

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 1 | 9 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 24 | / | -10m |
|----|---|------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 4 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | |
|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 2 | 4 |
|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

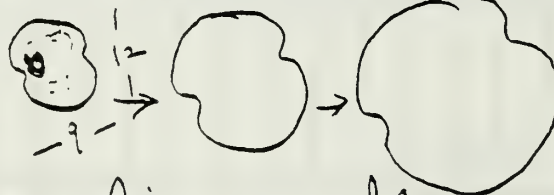
 cm²

$$\begin{array}{r} 250 \\ 795 \\ \hline 1045 \end{array}$$

NOTES:

Sample was not tea-colored. Was Lugol's used for preservation? * specimens do appear to be preserved.

Fires were smaller than under G1705 in the sample



coooo sphere, slip, non-flag uncell

color grey

No zooplankton seen x100

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

☐ Periphyton ☐ Phytoplankton

Sample

24/-10m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

② 16.5 (70 → 78)
 ③ 16.0 (80 → 70)
 ④ 15.5 (70 → 78.1)

| Taxa Code | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|-----------|-----------|-------|-------|
| G1705 | | 35 | 35 | | | | |
| G1801 | | 110 | 11 | | | | |
| G1704 | | III | 6 | | | | |
| A8400 | | III | 3 | | | | |
| A6760 | | 31 | 1 | | | | |
| A1802 | | III | 3 | | | | |
| A6540 | | I | 1 | | | | |
| A2880 | | III | 4 | | | | |
| A1670 | | I | 1 | | | | |
| A8431 | | II | 2 | | | | |
| A7987 | | I | 1 | | | | |
| A6531 | | I | 1 | | | | |
| C0000 | | I | 1 | | | | |

Reviewed by

Date

Sample Analyst

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 2 | 0 | 0 | 4 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 20 | - | 20 m |
|----|---|------|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 2 | 9 | 0 | 7 | 8 | 2 | | | |

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 7 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 2 | 8 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 250 \\ 797 \\ \hline 1047 \end{array}$$

NOTES:

No zooplankton seen at x100
* 60000 uncell, non-flag.
bacteria ~

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

五

| | |
|----|------|
| 26 | -20m |
|----|------|

[illegible][illegible]

Date _____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|-----|-------|------|
| Day | Month | Year |
| 2 | 0 | 0 |
| 4 | 8 | 2 |

SAMPLE IDENTIFICATION

| | | |
|----|---|-------|
| 21 | / | -40 m |
|----|---|-------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 7 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 5 | 3 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | |
|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 2 | 4 |
| X | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

$$\begin{array}{r} 803 \\ 250 \\ \hline 1053 \end{array}$$

NOTES:

Zooplankton (rotifer)

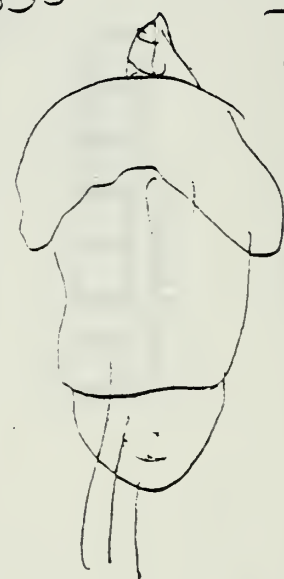
Synchaeta?

(20 or 20 on bottom of chamber.)

brute = 0 ?

COOOO = stained, non-spherical, flag, uncell

① = 11 = A8431



*COOOO = non stain COOOO

Gymnodinium fuscum also seen at x100

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

☐ Periphyton ☒ Phytoplankton

0.12 (70 → 10.1)

Sample

21/-40m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|-----|-----------|-------|-------|-----------|--|-----------|-------|-------|
| C1 | 901 | | 21 | 2 | | | | | |
| A8 | 400 | | | 7 | | | | | |
| C3 | 000 | | | 2 | | | | | |
| C3 | 000 | | -26 | 27 | | | | | |
| C1 | 705 | | | 3 | | | | | |
| C1 | 802 | | | 6 | | | | | |
| A1 | 670 | | | 3 | | | | | |
| A8 | 431 | | | 8 | | | | | |
| C3 | 000 | | | 12 | | | | | |
| A3 | 720 | | | 3 | | | | | |
| A6 | 720 | | | 1 | | | | | |
| A3 | 171 | | | 1 | | | | | |
| A3 | 880 | | | 1 | | | | | |
| A8 | 301 | | | 5 | | | | | |

*

Reviewed by

Sample Analyst

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 2 | 0 | 0 | 4 | 8 | 2 | | | |

SAMPLE IDENTIFICATION

| | |
|----|------|
| 22 | -60m |
|----|------|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 2 | 9 | 0 | 7 | 8 | 2 | | | |

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 5 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 1 | 9 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 905 \\ 250 \\ \hline 1050 \end{array}$$

NOTES:

Pure pollen

Gymnoclinium fuscum at x100

zooplankton (rotifer) 8.9/69.4 | 763/7.1

*COOOO = unisell, sph, elip non fly.

COOOO = non swim

9 " III



TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | | |
|---|---|---|---|
| N | S | I | G |
|---|---|---|---|

$$(5) 16, 5(10 \rightarrow 11, 9)$$

Trans. Reference Points

Stage Reference

| Sample | Rep |
|---------|-----|
| 22/-60m | |

[illegible]

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|---------------------|-------|
| A6760 | | 50. | 50 |
| A6700 | | 7 | 7 |
| E1705 | | 7 III, 2 | 10 |
| C1800 | | III | 4 |
| C1800 | | II | 2 |
| C1801 | | III | 1 |
| A1670 | | III | 3 |
| A8420 | | II | 2 |
| C9420 | | I | 1 |
| A7987 | | II | 2 |
| A3879 | | I | 1 |
| A8431 | | II | 2 |
| A3880 | | II | 2 |
| C3000 | | 3 | 3 |

Reviewed by

Conduct Product

Date

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 2 | 1 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | | |
|----|---|---|-----|
| 23 | / | - | 80m |
|----|---|---|-----|

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 7 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 6 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 2 | 6 |
|---|---|---|---|--|---|---|

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

Zooplankton (rotifer) x1000

Bosmina

*COOOO - uncel, non-flag, spheroid
non-dim

bacteria

C common

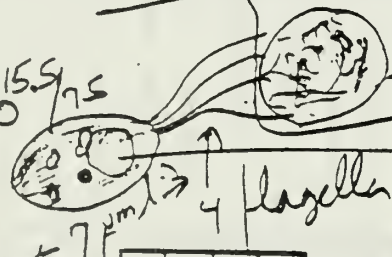
amouls = acronial look like

Synchaeta?

250
810
1060

60 bottom cell

+COOOO 15.5 7.5



The four flagella all probably dividing

G1705?
autospore


TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | C |
|---|---|---|

Phytoplankton

Sample

23-80m

Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

- ③ 16.5 (10 → 70)
- ④ 15.5 (70 → 80)
- ⑤ 15.4 (80 → 70)
- ⑥ 14.1 (70 → 70.2)

Trans. Reference Points

[illegible]

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|----------------------|-------|
| A6760 | | 8 | 8 |
| C0000 | | 27 | 27 |
| G1400 | | IIII 8 | 17 |
| G1705 | | III | 3 |
| A8301 | | IIII II | 7 |
| C9422 | | III | 4 |
| A8431 | | IIII IIII | 12 |
| A8400 | | III | 4 |
| A1690 | | IIII | 5 |
| G1904 | | II | 2 |
| C1802 | | IIII | 6 |
| C2000 | | III | 3 |
| C1801 | | II | 2 |
| G2014 | | II | 2 |
| C0000 | | II | 2 |

ANALYSIS

DATE

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
21 04 83

SAMPLE IDENTIFICATION

13/-100m

SAMPLING DATE

Day Month Year
29 07 82

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

1055 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 36
X Y

6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

Barley 5 - common

*Filina (2) 805
250
1053*
Zooplankton: Synchaeta

*COOOO : non stain, elip / sph uncell naffay.
COOOO

0:11

A9977

*stetinger
A1431?*
-5µ

+COOOO = see -80m per drawing.

7µm COOOO

5

*Amoeba: 15-20 common
3-4 / transect*

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

MSG

Phytoplankton

$$\textcircled{11} 12.0(80 \rightarrow 74.1)$$

③ 16.0 (80 → 70)

Phytoplankton

☒ Periphyton

Trans. Reference Points

Stage Reference

Sample

18/-100mm

22

[illegible]

| Taxa Code | Taxa Name |
|-----------|-----------|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 29 | 29 |
| 30 | 30 |
| 31 | 31 |
| 32 | 32 |
| 33 | 33 |
| 34 | 34 |
| 35 | 35 |
| 36 | 36 |
| 37 | 37 |
| 38 | 38 |
| 39 | 39 |
| 40 | 40 |
| 41 | 41 |
| 42 | 42 |
| 43 | 43 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |
| 48 | 48 |
| 49 | 49 |
| 50 | 50 |
| 51 | 51 |
| 52 | 52 |
| 53 | 53 |
| 54 | 54 |
| 55 | 55 |
| 56 | 56 |
| 57 | 57 |
| 58 | 58 |
| 59 | 59 |
| 60 | 60 |
| 61 | 61 |
| 62 | 62 |
| 63 | 63 |
| 64 | 64 |
| 65 | 65 |
| 66 | 66 |
| 67 | 67 |
| 68 | 68 |
| 69 | 69 |
| 70 | 70 |
| 71 | 71 |
| 72 | 72 |
| 73 | 73 |
| 74 | 74 |
| 75 | 75 |
| 76 | 76 |
| 77 | 77 |
| 78 | 78 |
| 79 | 79 |
| 80 | 80 |
| 81 | 81 |
| 82 | 82 |
| 83 | 83 |
| 84 | 84 |
| 85 | 85 |
| 86 | 86 |
| 87 | 87 |
| 88 | 88 |
| 89 | 89 |
| 90 | 90 |
| 91 | 91 |
| 92 | 92 |
| 93 | 93 |
| 94 | 94 |
| 95 | 95 |
| 96 | 96 |
| 97 | 97 |
| 98 | 98 |
| 99 | 99 |
| 100 | 100 |

✱

三

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C00000 | | 30 | 30 |
| A80000 | | I | 1 |
| C00000 | | 4 | 4 |
| C18001 | | 13 | 13 |
| A60600 | | 7 | 7 |
| C18000 | | 111 | 4 |
| C94200 | | 1111 | 6 |
| C14000 | | 13 | 13 |
| A20300 | | 11 | 3 |
| C30000 | | 1111 | 6 |
| A16000 | | 1111 | 7 |
| G10000 | | 11 | 2 |
| C00000 | | I | 1 |
| C00000 | | 11 | 2 |
| G20100 | | I | 1 |
| A99000 | | 11 | 3 |
| A83001 | | 11 | 1 |
| C10000 | | I | 1 |
| A84301 | | 11 | 2 |

+0

Reviewed by

1

1

D110

1

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
180583

SAMPLE IDENTIFICATION

19-120m

SAMPLING DATE
Day Month Year

290782

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1050 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

25031
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

800
250

NOTES:

Zooplankton rotifer Keratella



? *Zooplankton 78/20.1*

Bacteria
canon G



orange

amoeba ?



7-8 *account 1.75 times*

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

Phytoplankton

Sample

19/-120m

12

Stage Reference



| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Trans. Reference Points

(6) 4.5 (90 → 70

| | |
|--|--|
| | |
| | |
| | |
| | |

1898

(3) 16.0(70-78)

⑪ 15.5(80-70)

(915.2(70→80)

(614.5190-70

(714.070 → 71.9)

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C18002 | | | 8 |
| C18001 | | | 6 |
| A84000 | | | 2 |
| A67600 | | | 3 |
| C00000 | | 29 | 31 |
| A82001 | | | 5 |
| A31711 | | | 5 |
| G14000 | | | 9 |
| G17005 | | | 11 |
| A16700 | | | 5 |
| G12000 | | | 5 |
| A84211 | | | 4 |
| G17004 | | 2 | 2 |
| C94222 | | 1 | 1 |
| C2015 | | 3 | 3 |

[illegible]

Reviewed by

Date

George Herbert

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|-----|-------|------|
| Day | Month | Year |
| 19 | 05 | 83 |

SAMPLE IDENTIFICATION

| |
|----------|
| 20/-140m |
|----------|

SAMPLING DATE

| | | |
|-----|-------|------|
| Day | Month | Year |
| 29 | 07 | 82 |

PROJECT

| | | |
|---|----|----|
| D | 29 | 21 |
|---|----|----|

TOTAL SAMPLE TRANSPORT VOLUME

| | | |
|---|---|----|
| 1 | 0 | 50 |
|---|---|----|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | |
|---|----|---|---|---|---|
| 2 | 50 | : | 3 | 4 | 5 |
| X | | | Y | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | 0 | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

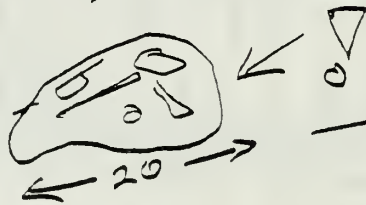
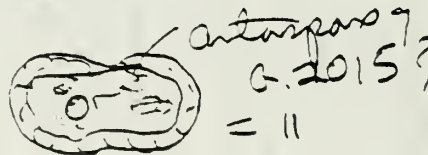
 cm²

$$\begin{array}{r} 250 \\ 800 \\ \hline 1050 \end{array}$$

NOTES:


Isolated amoeba?
Pure pollen
**c0000 = non flag, uni cell, spheroid, non-stem*

amoeba?
10
bacteria
c

7 c0000

3-4 times

antagonism?
G. 2015?
= 11

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Phytoplankton

Rep

| |
|--|
| |
| |
| |
| |
| |

- ③ 16.5 (80 → 70)
- ④ 16.0 (70 → 80)
- ⑤ 15.5 (80 → 70)
- ⑥ 15.0 (70 → 80)
- ⑦ 14.5 (80 → 78.2)

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C0000 | | 25 | 3 |
| C0100 | | | 1 |
| C0400 | | | 2 |
| C0000 | | | 2 |
| C0300 | | | 1 |
| C0800 | | | 2 |
| C0100 | | | 3 |
| C0800 | | | 2 |
| C0100 | | | 4 |
| C0100 | | | 6 |
| C0300 | | | 1 |
| C0200 | | | 4 |
| C0600 | | | 1 |
| C0100 | | | 3 |
| C0600 | | | 1 |
| C0100 | | | 1 |
| C0400 | | | 1 |
| C0700 | | | 1 |
| C0000 | | | 2 |
| C0900 | | | 3 |

Date _____

Control Analysis

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
19 05 83

SAMPLE IDENTIFICATION

15/-160m

SAMPLING DATE

Day Month Year
27 07 82

PROJECT

D 29 21

TOTAL SAMPLE TRANSPORT VOLUME

1050 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 29.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml



SED. CHAMBER BOTTOM AREA



cm²

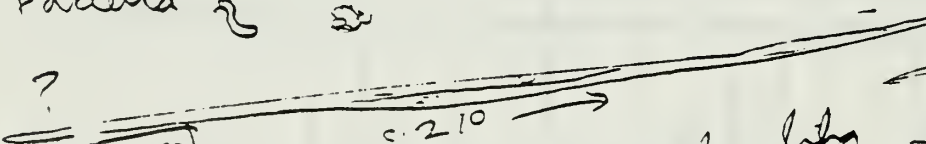
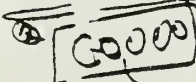

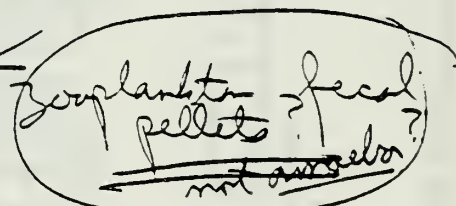

SED. CHAMBER BOTTOM AREA OBSERVED

cm²







NOTES:

Amoeba? 
per transient: 

Paramecia  

? 
[GOOOO]   
seems to be  but no evidence of frustule?

GOOOO

     
spherical 5-6 per

pure pollen +

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NISK

an unrecognizable
zooplankton



800
250
1050

Chlorella

Periphyton ☒ Phytoplankton

Sample

15 / -160m
Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

- (3) 16.5 (70 → 80)
 (4) 16.0 (80 → 70)
 (5) 15.5 (70 → 80)
 (6) 15.0 (80 → 70)
 (7) 14.5 (70 → 80)
 (8) 14.0 (80 → 70)
 (9) 13.5 (70 → 95)
 (10) 13.0 (80 → 70)
 (11) 12.0 (80 → 70)
 (12) 11.5 (70 → 80)
 (13) 11.0 (80 → 70)
 (14) 10.0 (70 → 730)

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|---|-----------|---|-------|-------|-----------|-----------|-------|-------|
| G | 2 | 0 | 1 | 5 | 2 | | | | |
| A | 8 | 3 | 0 | 1 | 2 | | | | |
| C | 1 | 8 | 0 | 1 | 4 | | | | |
| A | 3 | 7 | 3 | 0 | 3 | | | | |
| A | 8 | 4 | 0 | 0 | 2 | | | | |
| C | 0 | 0 | 0 | 0 | 1 | | | | |
| C | 0 | 0 | 0 | 0 | 2 | | | | |
| A | 6 | 7 | 6 | 0 | 1 | | | | |
| A | 1 | 6 | 7 | 0 | 3 | | | | |
| A | 3 | 1 | 7 | 1 | 8 | | | | |
| G | 1 | 7 | 0 | 5 | 7 | | | | |
| A | 6 | 6 | 9 | 0 | 2 | | | | |
| G | 1 | 7 | 0 | 4 | 2 | | | | |
| C | 0 | 0 | 0 | 0 | 1 | | | | |
| A | 8 | 4 | 3 | 1 | 1 | | | | |
| A | 0 | 0 | 0 | 0 | 1 | | | | |
| A | 3 | 8 | 3 | 0 | 1 | | | | |

*

(2)

(2)

Reviewed by

Date

Sample Analysis

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 2 | 0 | 0 | 5 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | |
|----|-------|
| 16 | -150m |
|----|-------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | |
|---|---|---|
| 9 | 3 | 1 |
|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 2 | 4 | . | 5 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

NOTES:

spores
G1704 etc?○○○○ 2.5
↑ bacteria?

orange acc.

Circum 2-3 transect
anaba?
(fecal pellets?)

TOTAL UNITS COUNTED

| | | | |
|--|--|---|---|
| | | 3 | 7 |
|--|--|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | C |
|---|---|---|

Count stopped at
end of 12 transect.
Too sparse to get
100 units even
with concentration

☐ Periphyton ☒ Phytoplankton

Sample 16/-180m Rep 1

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

- 1 16.5(80 → 70)
- 2 16.5(80 → 70)
- 3 16.5(80 → 70)
- 4 16.5(80 → 70)
- 5 15.5(80 → 70)
- 6 15.0(70 → 80)
- 7 14.5(80 → 70)
- 8 14.0(70 → 80)
- 9 13.5(80 → 70)
- 10 13.0(70 → 80)

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | | Taxa Name | | Tally | Count |
|-----------|------|-----------|--|-------|-------|-----------|--|-----------|--|-------|-------|
| C | 0000 | | | | | | | | | | |
| C | 9422 | | | 9 | 9 | | | | | | |
| A | 1670 | | | | 4 | | | | | | |
| A | 6760 | | | | 4 | | | | | | |
| C | 0000 | | | | 2 | | | | | | |
| A | 6690 | | | | 1 | | | | | | |
| G | 1705 | | | | 2 | | | | | | |
| C | 1801 | | | | 5 | | | | | | |
| G | 0000 | | | | 3 | | | | | | |
| A | 3730 | | | | 1 | | | | | | |
| G | 1400 | | | | 4 | | | | | | |
| A | 3171 | | | | 1 | | | | | | |

Reviewed by _____

Date _____

Sample Analysis

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
200583

SAMPLE IDENTIFICATION

17-200m

SAMPLING DATE
Day Month Year

290782

PROJECT

D2721

TOTAL SAMPLE TRANSPORT VOLUME

11050 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250:22.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

250
800
1050

NOTES:

"Arcebia" ~~canon~~ ~~4-5~~ ~~times~~

33 - only phy?
from filter?

12
5-6 µm
① 20000

③ 3

① A0000
A0000

clusterum
clusteropsis?

② A5000

no defined nucleus or pyrenoid

chloroplast seems to run entire length of cell.

TOTAL UNITS COUNTED

75

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

NOTE: I observed 15 transects thinking I might be able to reach 100. The cells were too sparse. Only counted 75.



3) 18.0 (80 → 70) (13) 13.0 (80 → 70)
 4) 17.5 (70 → 70) (14) 12.5 (70 → 80)
 5) 17.0 (80 → 70) (15) 12.0 (80 → 70)
 6) 16.5 (70 → 80) trans. Reference Po
 7) 16.0 (80 → 70)
 8) 15.5 (70 → 70)
 9) 15.0 (70 → 70)
 10) 14.5 (70 → 70)

Stage Reference

Sample

| | | |
|----|------|-----|
| 17 | 900m | Rep |
|----|------|-----|

Count

Tally

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Java Code

① ② ③

Reviewed by

Date _____

Sample Answer

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 1 0 4 8 3

SAMPLE IDENTIFICATION

96 / Surface

SAMPLING DATE
Day Month Year

1 5 0 7 8 2

PROJECT

0 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 0 3 5 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

2 5 0 : 2 9 5
X Y

6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 0 ml

SED. CHAMBER BOTTOM AREA

5 0 0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

5 0 0 cm²

NOTES:

Calycomonas 7/9/17
yellowish brown. 35 75.9/17 (4)
: 11
Bacteria. 00
? clear
4-5 yellowish
chromulina ?

many particle c. 1 μm orange (some) others colorless

TOTAL UNITS COUNTED

1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSC

Phytoplankton

☒ Periphyton

Q6.0 (80 → 71.1)

Trans. Reference Points

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Sample

| | | |
|----|-----|-----|
| 96 | 800 | Rep |
|----|-----|-----|

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-----------------|-------|
| C0000 | | 29. | 29 |
| A6760 | | 43 | 43 |
| G7705 | | 11 | 6 |
| A8731 | | 1 | 1 |
| C1901 | | 112 | 4 |
| A7109 | | 1 | 1 |
| G2014 | | 1 | 1 |
| A8002 | | 1111 | 8 |
| A3880 | | 1111 | 5 |
| A7987 | | 11 | 2 |

Date _____

Sample Analyst

Reviewed by

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 4 | 0 | 4 | 9 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | | |
|----|---|----|---|
| 95 | - | 20 | m |
|----|---|----|---|

SAMPLING DATE

| | | | | | |
|---|---|---|---|---|---|
| 1 | 5 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|--|--|---|---|
| 2 | 5 | 0 | : | | | 4 | 4 |
|---|---|---|---|--|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 785 \\ 250 \\ \hline 1035 \end{array}$$

NOTES:

Flocculent material abundant (decomposition of sample?)

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Phytoplankton

⑪ 13.0 (80 - 370)
⑫ 12.5 (70 - 760)

Trans. Reference Points

| | | |
|--------|--------|--|
| Sample | 95/20m | |
|--------|--------|--|

| | |
|--|--|
| | |
| | |
| | |
| | |

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Rep

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-----------|-------|
| C1800 | | 11,56,111 | 6 |
| C1600 | | 11 | 2 |
| A8400 | | 11111 | 7 |
| A7960 | | 11 | 2 |
| A4100 | | 111 | 3 |
| A5973 | | 11 | 2 |
| A3730 | | 1111 | 5 |
| A1640 | | 1111 | 4 |
| A8431 | | 1111 | 5 |
| A6760 | | 1111 | 2 |
| A4101 | | 1111 | 4 |
| G1704 | 32x512 | 1 | 1 |

Cambridge, Mass.

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 4 | 0 | 4 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 94 | / | -40m |
|----|---|------|

SAMPLING DATE

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 1 | 5 | 0 | 7 | 8 | 2 | | | |

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | | 5 | 6 |
| X | | | | Y | | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 785 \\ 250 \\ \hline 1035 \end{array}$$

NOTES:

TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 5 | 0 | 4 | 8 | 2 |
|---|---|---|---|---|---|

Day Month Year

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 93 | / | -60m |
|----|---|------|

SAMPLING DATE

| | | | | | |
|---|---|---|---|---|---|
| 1 | 5 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

Day Month Year

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 5 | 7 |
|---|---|---|---|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 790 \\ 250 \\ \hline 1040 \end{array}$$

NOTES:

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 5 | 0 | 4 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 92 | / | -80m |
|----|---|------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 1 | 5 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 8 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 5 | 2 | . | 5 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 788 \\ 250 \\ \hline 1038 \end{array}$$

NOTES:

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Periphyton

☒ Phytoplankton

| | |
|----------|-----|
| 92-1-80m | Rep |
|----------|-----|

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Code | Taxa Name |
|------|----------------|
| 1 | 13.5 (80 → 70) |
| 2 | 13.5 (80 → 70) |
| 3 | 16 (70 → 80) |
| 4 | 15.5 (80 → 70) |
| 5 | 15.0 (70 → 80) |
| 6 | 14.5 (80 → 70) |
| 7 | 14.0 (70 → 80) |
| 8 | 13.5 (80 → 70) |
| 9 | 13.0 (70 → 80) |
| 10 | 12.5 (80 → 75) |

Reviewed by

Date _____

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED 050483
Day Month Year

SAMPLE IDENTIFICATION

91 / -100mSAMPLING DATE
Day Month Year150782

PROJECT

22921

TOTAL SAMPLE TRANSPORT VOLUME

1038 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 57.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

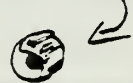
SED. CHAMBER BOTTOM AREA

1.0 cm²


SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²
$$\begin{array}{r} 788 \\ 250 \\ \hline 1038 \end{array}$$

NOTES:

C0000 = spherical uncell (2.5d); no flagella


Some cells appeared to be decomposing?

A9999 = 
-6-

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 X

ANALYST

NSG

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED 050483

SAMPLE IDENTIFICATION

90/-120m

SAMPLING DATE

Day Month Year

150782

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1038 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250:54.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²

250

788

1038

NOTES:

COOOO = spherical unicells, non-flagellated phase slide 6 ml.
 Protozoans Rel. abundant (amoebae - see series on back)

Only counted 45 because cells were so sparse even after concentrating the sample

TOTAL UNITS COUNTED

45

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☒ Phytoplankton

| Sample | Rep |
|----------|-----|
| 90/-120m | |

| Stage | Reference |
|-------|-----------|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 29 | 29 |
| 30 | 30 |
| 31 | 31 |
| 32 | 32 |
| 33 | 33 |
| 34 | 34 |
| 35 | 35 |
| 36 | 36 |
| 37 | 37 |
| 38 | 38 |
| 39 | 39 |
| 40 | 40 |
| 41 | 41 |
| 42 | 42 |
| 43 | 43 |
| 44 | 44 |
| 45 | 45 |
| 46 | 46 |
| 47 | 47 |
| 48 | 48 |
| 49 | 49 |
| 50 | 50 |
| 51 | 51 |
| 52 | 52 |
| 53 | 53 |
| 54 | 54 |
| 55 | 55 |
| 56 | 56 |
| 57 | 57 |
| 58 | 58 |
| 59 | 59 |
| 60 | 60 |
| 61 | 61 |
| 62 | 62 |
| 63 | 63 |
| 64 | 64 |
| 65 | 65 |
| 66 | 66 |
| 67 | 67 |
| 68 | 68 |
| 69 | 69 |
| 70 | 70 |
| 71 | 71 |
| 72 | 72 |
| 73 | 73 |
| 74 | 74 |
| 75 | 75 |
| 76 | 76 |
| 77 | 77 |
| 78 | 78 |
| 79 | 79 |
| 80 | 80 |
| 81 | 81 |
| 82 | 82 |
| 83 | 83 |
| 84 | 84 |
| 85 | 85 |
| 86 | 86 |
| 87 | 87 |
| 88 | 88 |
| 89 | 89 |
| 90 | 90 |
| 91 | 91 |
| 92 | 92 |
| 93 | 93 |
| 94 | 94 |
| 95 | 95 |
| 96 | 96 |
| 97 | 97 |
| 98 | 98 |
| 99 | 99 |
| 100 | 100 |

| Trans. | Reference Points |
|--------|--|
| | <div style="display: flex; justify-content: space-around;"> <div style="width: 40px; height: 40px;"></div> <div style="width: 40px; height: 40px;"></div> </div> |
| | <div style="display: flex; justify-content: space-around;"> <div style="width: 40px; height: 40px;"></div> <div style="width: 40px; height: 40px;"></div> <div style="width: 40px; height: 40px;"></div> <div style="width: 40px; height: 40px;"></div> </div> |

| Code | Taxa Name | Tally |
|------|-----------------|-------|
| 3 | 18.0 (80 → 70) | |
| 4 | 17.5 (70 → 30) | |
| 5 | 17.0 (80 → 110) | |
| 6 | 16.5 (110 → 80) | |
| 7 | 16.0 (80 → 70) | |
| 8 | 15.5 (70 → 80) | |
| 9 | 15.0 (80 → 70) | |
| 10 | 14.5 (70 → 80) | |
| 11 | 14.0 (80 → 70) | |
| 12 | 13.5 (70 → 80) | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|----------|-------|
| AQ0000 | | '15 | 15 |
| A41001 | | I | 1 |
| C18000 | | 4, III | 7 |
| A38800 | | I | 1 |
| G17005 | | II | 2 |
| A16700 | | III | 3 |
| A84000 | | II | 2 |
| C30000 | | III, III | 6 |
| A66900 | | I | 1 |
| A5973 | | I | 1 |
| C9432 | | I | 1 |
| A31710 | | II | 2 |
| G140 | | III | 3 |

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|----------------|----|----|
| Day Month Year | | |
| 06 | 04 | 82 |

SAMPLE IDENTIFICATION

| | |
|----|-------|
| 89 | -140m |
|----|-------|

SAMPLING DATE

| | | |
|----------------|----|----|
| Day Month Year | | |
| 15 | 07 | 82 |

PROJECT

| |
|-------|
| 02921 |
|-------|

TOTAL SAMPLE TRANSPORT VOLUME

| |
|-------|
| 11044 |
|-------|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | |
|-----|---|----|
| 250 | : | 35 |
| X | | Y |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | |
|---|---|---|
| 5 | • | 0 |
|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| |
|---|
| • |
|---|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| |
|---|
| • |
|---|

 cm²

NOTES:

C0000 = spherical, unicells, non flagellated
(c. 2.5 d) alsoThere were two forms of anulirodesmus
of c1802 and c1801also observed, but not in count, was Tribonema affine.
(A1670)~~Protozoans (amphibians) have two fecal pellets!~~

TOTAL UNITS COUNTED

| |
|------|
| 1100 |
|------|

MICROSCOPE MAGNIFICATION


| |
|------|
| 1500 |
|------|

 X

ANALYST

| |
|-----|
| NS6 |
|-----|

$$\begin{array}{r} 794 \\ 250 \\ \hline 1044 \end{array}$$



Phytoplankton

Stage Reference

| |
|--|
| |
| |
| |
| |
| |

Trans. Reference Points

| | |
|--|--|
| | |
| | |
| | |
| | |

Sample

| | |
|---------|-----|
| 89-140m | Rep |
|---------|-----|

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C1801 | | 16 | 16 |
| A2171 | | 17 | 17 |
| C0000 | | 48 | 48 |
| A8400 | | 11 | 2 |
| A4101 | | 11 | 2 |
| A2730 | | 1 | 1 |
| G1400 | | 1 | 1 |
| G1401 | | 1 | 1 |
| C3000 | | 11 | 2 |
| G1405 | | 1 | 1 |
| C1802 | | 9 | 9 |

Reviewed by

Date _____

Sample Project

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 6 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | | | | |
|---|---|---|---|---|---|
| 8 | 8 | - | 1 | 6 | 0 |
|---|---|---|---|---|---|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 1 | 5 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 8 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 3 | 8 | . | 5 |
|---|---|---|---|---|---|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

250

788

1038

NOTES:

COOOO = spherical or ellipsoidal uncell, non flagellated
⊙ ⊙ (4.5 μm d)occasional spherical cell, no plastid or nucleus apparent
3.5 μm d. (considered than bacteria)Protozoan (amoeba) 18 μm d. → (saw c. 20 in three
strips)

Fungal mycelium



TOTAL UNITS COUNTED

| | | | | | |
|--|--|---|---|---|---|
| | | 1 | 1 | 0 | 0 |
|--|--|---|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Phytoplankton

Sample

| | |
|---------|-----|
| 28/-160 | Rep |
|---------|-----|

Stage Reference

[illegible]

Trans. Reference Points

- 854 — 08 0'41 (6)
 08 — 06 5'41 (9)
 01 — 08 0'51 (5)
 00 — 06 5'51 (4)
 00 — 08 0'41 (7)

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C 0 0 0 0 | | 152 | 5 |
| A 2 1 7 0 | | 28 | 2 |
| A 6 5 7 0 | | I | 1 |
| G 1 4 0 0 | | II | 2 |
| A 3 7 3 0 | | IIII | 4 |
| C 1 8 0 1 | | III | 3 |
| G 1 4 0 1 | | I | 1 |
| G 1 7 0 4 | | II | 2 |
| A 6 6 9 0 | | I | 1 |
| G 1 8 0 2 | | IIII | 5 |
| C 2 0 0 0 | | I | 1 |
| A 1 6 7 0 | | I | 1 |

Reviewed by

Date _____

Example 1

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 4 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| |
|----------|
| 87/-180m |
|----------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 1 | 5 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 2 | 6 |
|---|---|---|---|--|---|---|

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|


 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 250 \\ 780 \\ \hline 1030 \end{array}$$

NOTES:

Coccolith = spherical, non flagellate unicells
1.5-2.0 (d) *non flagellate bacteria? orange sheath.*
1.5 μ m d.

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Periphyton

☒ Phytoplankton

| | | |
|----|-------|-----|
| 87 | -180m | Rep |
|----|-------|-----|

[illegible]

- 3) 13,0 (80) — 70)
- 4) 13,5 (10) — 80)
- 5) 14,0 (80) — 70)
- 6) 14,5 (70) — 70)
- 7) 15,0 (10) — 70)
- 8) 15,5 (70) — 70)
- 9) 16,0 (80) — 70)
- 10) 16,5 (10) — 80)
- 11) 17,0 (80) — 79.

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|--------|-------|
| 200000 | | 30 | 30 |
| A3171 | | 41 | 41 |
| A4101 | | 111 | 4 |
| C1802 | | 111, 2 | 9 |
| E1400 | | 111 | 4 |
| A3930 | | 111 | 3 |
| A1670 | | 111 | 6 |
| A8400 | | 1 | 1 |
| A6760 | | 1 | 1 |
| G1704 | | 1 | 1 |

Reviewed by

Date _____

Example 1

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
060483

SAMPLE IDENTIFICATION

86 - 200mSAMPLING DATE
Day Month Year150782

PROJECT

02921

TOTAL SAMPLE TRANSPORT VOLUME

928 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 25
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

5.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

5.0 cm²

250

678

928

NOTES:

COCCO = spherical or ellipsoidal unicell, non-flagellates
 amoeba/protocoon 16-18 μ m diameter.
 Fungal hyphae. (rare)
 non-fungal bacteria. (o)

TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG



Phytoplankton

$$\begin{array}{r} (3) \quad 17.6 \quad (80) \quad 0.1 \\ (4) \quad 16.5 \quad (70) \quad 0.1 \\ (5) \quad 16.0 \quad (80) \quad 0.1 \\ (6) \quad 15.5 \quad (70) \quad 0.1 \end{array}$$

Stage Reference

Trans. Reference Points

Sample

| | |
|----------|-----|
| 86/-200m | Rep |
|----------|-----|

[illegible]

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C00000 | | 40 | 40 |
| C00000 | | 1 | 1 |
| A00000 | | 33 | 33 |
| A00000 | | 1 | 1 |
| A00000 | | 9 | 9 |
| A00000 | | 6 | 6 |
| C00000 | | 4 | 4 |
| C00000 | | 3 | 3 |
| A00000 | | 1 | 1 |
| G00000 | | 2 | 2 |

Reviewed by

Data.

Carole Ancelet

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
070483

SAMPLE IDENTIFICATION

32 / Surface

SAMPLING DATE

Day Month Year
290782

PROJECT

D 2921

TOTAL SAMPLE TRANSPORT VOLUME

1025 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 33
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

cm²

SED. CHAMBER BOTTOM AREA OBSERVED

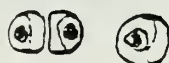
cm²

$$\begin{array}{r} 250 \\ 783 \\ \hline 1035 \end{array}$$

NOTES:

C5000 = spherical or elliptical uncells non-flagellated
(1.5-2.0 µm d.)

↑ uncells stringy purple — are
chlorophyte uncells!!!



also observed another Witzschia sp. described on back

TOTAL UNITS COUNTED

1000

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| Day | | Month | | Year | |
|-----|---|-------|---|------|---|
| 0 | 7 | 0 | 4 | 8 | 3 |

SAMPLE IDENTIFICATION

65 / -10m

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 3 | 5 |
|---|---|---|---|

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 3 | 9 |
|---|---|---|---|--|---|---|

1

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | • | 0 |
|--|--|---|---|---|

 ml

| | | | | | |
|--|--|---|---|---|----|
| | | 5 | 0 | 0 | ml |
|--|--|---|---|---|----|

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

 cm²

| | | | | | |
|--|--|---|--|--|--|
| | | • | | | |
|--|--|---|--|--|--|

cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

 cm²

| | | | | | |
|--|--|---|--|--|--|
| | | ● | | | |
|--|--|---|--|--|--|

 cm^2

NOTES :

Protozoan - animals

12 pm

My dear Mr. [illegible]

~~Elisepano~~ 17/74.8

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | / | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

x

ANALYST

NSG



Phytoplankton

Sample

| | |
|----|--------|
| 65 | - 10 m |
|----|--------|

199

Stage Reference

[illegible]

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

[illegible]

Reviewed by

Date _____

Formula Analyt

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 0 | 7 | 0 | 4 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | |
|----|------|
| 64 | -20m |
|----|------|

SAMPLING DATE

Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 1 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 2 | 5 | 0 | : | | 3 | 5 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

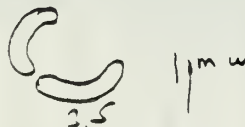
SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

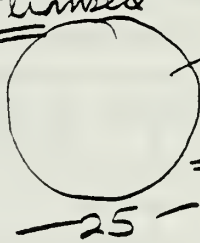
 cm²
$$\begin{array}{r} 250 \\ 760 \\ \hline 1010 \end{array}$$

NOTES:

6µm
Rhodospirillum? C. 10 per transect



protist/amoeba



golden yellow

Gymno fusum



Colorless with particles

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|



Phytoplankton

③ 16 (90 — 70)
④ 5.5 (70 — 74.4)

Stage Reference

Trans. Reference Points

Sample

| | |
|--------|-----|
| 64-20m | Rep |
|--------|-----|

| |
|--|
| |
| |
| |
| |
| |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C1802 | | 118 | 19 |
| A8131 | | 6 | 6 |
| C1801 | | 28 | 28 |
| A8100 | | | 9 |
| G1704 | | | 5 |
| A3879 | | 1 | 1 |
| A6160 | | | 3 |
| G1705 | | | 2 |
| A1970 | | 1 | 1 |
| C0000 | | 25 | 25 |

Reviewed by

Date _____

Sample Analysis

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 0 | 7 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 63 | / | -40m |
|----|---|------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 0 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|--|
| 2 | 5 | 0 | : | | | 2 | 6 | |
| | | | | X | Y | | | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

250
 790

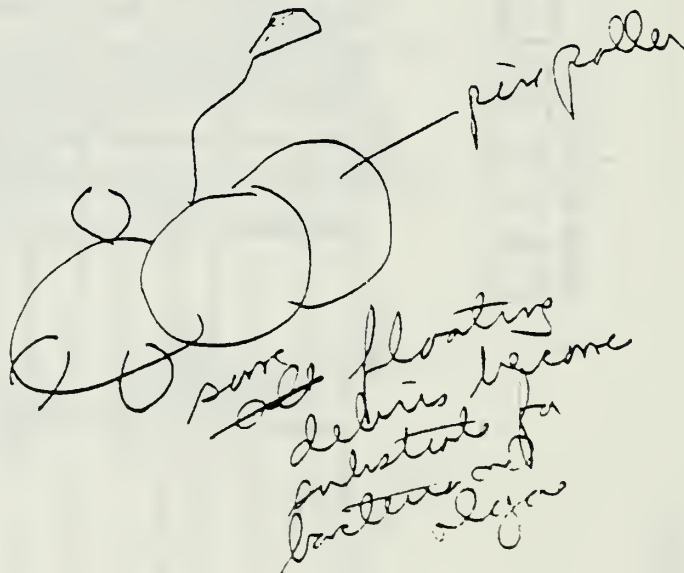
 1040

NOTES:



protozoan ameba

Rotifers: Polychaeta



TOTAL UNITS COUNTED

| | | | | |
|--|--|---|---|---|
| | | 1 | 0 | 0 |
|--|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

☐ Periphyton ☒ Phytoplankton

② 16, 213 → 200
③ 160 (80 → 743)

Sample

63 / -40m Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|---|-----------|------------------|-------|-----------|--|-----------|-------|-------|
| C180 | 1 | | 14 | 16 | | | | | |
| A840 | 0 | | 8 | 9 | | | | | |
| C180 | 2 | | 25 | 26 | | | | | |
| C300 | 0 | | 11 11 | 12 | | | | | |
| A410 | 1 | | 1 | 1 | | | | | |
| A654 | 0 | | 1 | 2 | | | | | |
| A167 | 0 | | 11 | 3 | | | | | |
| A676 | 0 | | 12 | 1 | | | | | |
| A373 | 0 | | 1 | 6 | | | | | |
| A843 | 1 | | 11 | 23 | | | | | |
| C000 | 0 | | 22 | | | | | | |

Reviewed by

Date

Sample Analyst

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
08 04 83

SAMPLE IDENTIFICATION

62 / - 60 m

SAMPLING DATE

Day Month Year
29 07 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1 0 3 8 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 25
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

250

788

1038

NOTES:

abundance a empty larvae.



bacteria attached

to sides of
larvae. 9
A8431

WHY
ARE THERE
"BACTERIA"
IN THERE 40
LORICAS?

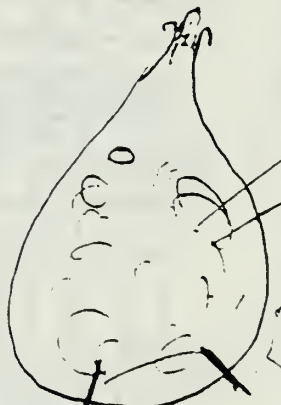


Rhodospirillum

3.5
1.5 w

c3000 ?
or bacterium (I called it c3000)

COOOO = unicells, non-flagellat 2-2.5 d.
Protozoon (amoeba?)



stain
p. fle.

G2015

Peridinium
acanthoporum

also Polyarthra

delicostera ?

Butter also st

16.5 / 7.5.9

Helicostia

longispina

TOTAL UNITS COUNTED

1 1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSG



area
sides
curved
stems
mid. aln.

Possible decomp
some cell. - the bacteria
presence? moving
brownish motion in the
larvae might indicate this

Phytoplankton

(3)

Trans. Reference Points

| Stage | Reference |
|-------|-----------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
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| 28 | |
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| 30 | |
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| 88 | |
| 89 | |
| 90 | |
| 91 | |
| 92 | |
| 93 | |
| 94 | |
| 95 | |
| 96 | |
| 97 | |
| 98 | |
| 99 | |
| 100 | |

| |
|---|
| |
| . |
| |
| |
| |

Tally

[illegible]

Date _____

Carle A. A. A.

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 0 | 8 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|---|------|
| 53 | / | -80m |
|----|---|------|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 2 | 9 | 0 | 7 | 8 | 2 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 1 | 5 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|--|--|---|---|
| 2 | 5 | 0 | : | | | 2 | 1 |
|---|---|---|---|--|--|---|---|

X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 250 \\ 765 \\ \hline 1015 \end{array}$$

NOTES:

Bacteria: Rhodo spir / 3
Amoeba 11

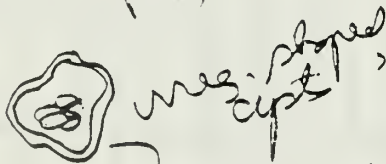
Rotifer 73.1/17

Pollen (prio)

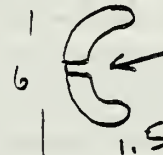
Kelliaella

longispina

Polyarthra

egg-shaped
cysts

Rotifer eggs?

this type of
dividing
the as C3000
But what is it?
could be Obolus
strobilatus
etc.9-10
yellow
yellowSaw Peridinium aciculiferum in sample

| | |
|----|------|
| G. | 2015 |
|----|------|

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | K |
|---|---|---|

Phytoplankton

Sample

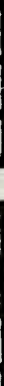
| | |
|----------|-----|
| 53 / -Dm | Rep |
|----------|-----|

Stage Reference

| |
|--|
| |
| |
| |
| |
| |
| |

(5) 10.0 (9) 10.0
 (5) 15.5 (4) 15.5
 (5) 15.0 (8) 15.0

Reference Points



| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C180 | | 21 | 21 |
| C180 | | 26 | 26 |
| A430 | | 5 | 5 |
| A160 | | | 5 |
| C100 | | 8 | 8 |
| C940 | | | 5 |
| A840 | | 16 | 16 |
| A670 | | 15 | 15 |
| C300 | | 4 | 4 |
| A370 | | | 5 |
| A570 | | 1 | 1 |
| A310 | | 1 | 1 |
| A410 | | 1 | 1 |

Reviewed by

Data

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED 080483
Day Month Year

SAMPLE IDENTIFICATION

44 / -100mSAMPLING DATE
Day Month Year29 07 82

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1039 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

250 : 29
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

7.89 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1039 cm²250
789
1039

NOTES:

Bacteria = S
minimaDoes have what
appears to be a
planted toughCall it C3000 still
probably a member
of the Chlorococcoid
relatedappears to be a
Chlorococcoidpurple
staining10.5
± ?Radiolaria: Keratella quadrataand another
Radiolaria of similar size
but no distinguishing
features

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG



一

1

三

一

9



| | | |
|----|---------|-----|
| 44 | -100 mm | Rep |
|----|---------|-----|

| | | |
|----|---------|-----|
| 44 | -100 mm | Rep |
|----|---------|-----|

| | | |
|----|---------|-----|
| 44 | -100 mm | Rep |
|----|---------|-----|

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| C1802 | | 3,33 | 3 |
| G1800 | | | 4 |
| C1801 | | 25 | 5 |
| A3171 | | | 4 |
| A1670 | | | 2 |
| C0000 | | -3,7 | 4 |
| G1705 | | | 3 |
| G1400 | | 1 | 1 |
| C9422 | | | 3 |
| A8431 | | | 2 |
| C3000 | | 9 | 9 |
| A6760 | | 8 | 8 |

Date _____

Concise Analyst

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|-----|-------|------|
| Day | Month | Year |
| 11 | 04 | 83 |

SAMPLE IDENTIFICATION

| | | | |
|----|---|-----|---|
| 50 | - | 120 | m |
|----|---|-----|---|

SAMPLING DATE
Day Month Year

| | | |
|----|----|----|
| 29 | 07 | 82 |
|----|----|----|

PROJECT

| |
|-------|
| 02921 |
|-------|

TOTAL SAMPLE TRANSPORT VOLUME

| |
|------|
| 1033 |
|------|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | |
|-----|---|----|
| 250 | : | 21 |
| X | | Y |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | |
|---|---|---|
| 5 | . | 0 |
|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | |
|--|---|--|
| | . | |
|--|---|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | |
|--|---|--|
| | . | |
|--|---|--|

 cm²
$$\begin{array}{r} 250 \\ 783 \\ \hline 1033 \end{array}$$

NOTES:

Bacteria ♂ (abundant)

* 10000 =

no starch
plasma10000 = starch plasma
= 10000no zooplankton seen at
100 X

TOTAL UNITS COUNTED

| | | |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Periphyton ☒ Phytoplankton

Sample

50 / -100m Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

12.5 (70)
 16.0 (80) → 70
 15.5 (70) → 72.3

| Taxa Code | | Taxa Name | Tally | Count | Taxa Code | | Taxa Name | Tally | Count |
|-----------|------|-----------|--------|-------|-----------|--|-----------|-------|-------|
| A | 0000 | | | | | | | | |
| C | 1800 | | 8 | 8 | | | | | |
| C | 1800 | | 5 | 5 | | | | | |
| A | 3171 | | 23 | 23 | | | | | |
| G | 0000 | | 11, 13 | 1 | | | | | |
| G | 1400 | | | 3 | | | | | |
| G | 1400 | | | 3 | | | | | |
| G | 1400 | | | 1 | | | | | |
| G | 1400 | | | 3 | | | | | |
| G | 1400 | | | 2 | | | | | |
| A | 1670 | | | 5 | | | | | |
| A | 1670 | | | 1 | | | | | |
| C | 3000 | | | 1 | | | | | |

*

Reviewed by

Date

Sample Analysis

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | |
|----------------|---|---|
| Day Month Year | | |
| 1 | 5 | 0 |
| 4 | 8 | 3 |

SAMPLE IDENTIFICATION

| |
|-----------|
| 47 / 140m |
|-----------|

SAMPLING DATE

| | | |
|----------------|---|---|
| Day Month Year | | |
| 2 | 9 | 0 |
| 7 | 8 | 2 |

PROJECT

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 2 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | |
|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 2 | 6 |
| X | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 5 | . | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | . | | | |
|--|--|---|--|--|--|

 cm²
$$\begin{array}{r} 250 \\ 792 \\ \hline 1042 \end{array}$$

NOTES:

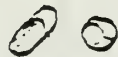
Zooplankton: PolyarthraBacteria ?

Amoeba



1-2 per transect

*C0000



no starch stain



7 75.8/22.6

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | B | G |
|---|---|---|



Phytoplankton

49/-140m

129

11

② 17.0 (70 → 80)
④ 16.5 (80 → 71.8)
⑤ 12.0 (70 → 76.8)

Trans. Reference Points

Tally

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Java Code

米

| | | | | | | | |
|---|---|---|---|---|---|----|---|
| C | 0 | 0 | 0 | 0 | 0 | 58 | 5 |
| A | 3 | 1 | 7 | 0 | 1 | 20 | 2 |
| C | 1 | 8 | 0 | 2 | | 1 | 1 |
| A | 6 | 7 | 6 | 0 | | 5 | 5 |
| A | 4 | 1 | 0 | 1 | | 1 | 1 |
| A | 1 | 6 | 7 | 0 | | 3 | 3 |
| G | 1 | 7 | 0 | 5 | | 3 | 3 |
| C | 1 | 8 | 0 | 1 | | 4 | 4 |
| A | 3 | 7 | 3 | 0 | | 1 | 1 |
| A | 7 | 9 | 8 | 7 | | 1 | 1 |

[illegible]

Carole Ancelet

010

LABORATORY DATA REPORT

PHYTOPLANKTON ANALYSIS

DATE PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| 1 | 8 | 0 | 4 | 8 | 3 |
|---|---|---|---|---|---|

SAMPLE IDENTIFICATION

| | | |
|----|------|---|
| 35 | -160 | m |
|----|------|---|

SAMPLING DATE

| | | |
|----|----|----|
| 29 | 07 | 82 |
|----|----|----|

PROJECT

| |
|-------|
| 02921 |
|-------|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 1 | 0 | 4 | 4 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | |
|---|---|---|---|---|---|
| 2 | 5 | 0 | : | 3 | 0 |
| X | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | |
|---|---|---|
| 5 | . | 0 |
|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0 | . | 0 | 0 | 0 |
|---|---|---|---|---|---|

 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0 | . | 0 | 0 | 0 |
|---|---|---|---|---|---|

 cm²

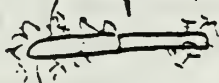
cells tallied
were intact
though!

| |
|------|
| 250 |
| 794 |
| 1044 |

NOTES:

Was this sample not preserved? why are these cell here?

Bacteria: clumping rod-like bacteria 10-15 μm.



Particulate?

E0000

16 : 14



flakes with
hole in all

These "flakes" are
abundant. Each
have a "cell"
and the remainder
opaque.

* C0000



no stain

TOTAL UNITS COUNTED

| | | |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Close these like
Chroococcoid

These look like
epidermal cell?

no zooplankton

(OVER)

☐ Periphyton ☒ Phytoplankton

Sample

35/-160m
Bap

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | Taxa Name | Tally | Count | Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|---------------|-------|-----------|-----------|-------|-------|
| A1670 | | 11 | 2 | | | | |
| A6760 | | 1 | 1 | | | | |
| A8400 | | 11 | 6 | | | | |
| C1802 | | 1 | 1 | | | | |
| A3171 | | 1 | 2 | | | | |
| A4101 | | 1 | 1 | | | | |
| A3020 | | 1 | 1 | | | | |
| E0000 | | 57.21 | 78 | | | | |
| C0000 | | 5.1 | 7 | | | | |
| C1705 | | 1 | 1 | | | | |

*

Reviewed by

Date

Camelia Anagnost

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 8 0 4 8 3

SAMPLE IDENTIFICATION

38 / -180 m

SAMPLING DATE
Day Month Year

2 9 0 7 8 2

PROJECT

D 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 0 4 0 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

2 5 0 : 2 8
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 ml

SED. CHAMBER BOTTOM AREA



1 0 0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1 0 0 cm²

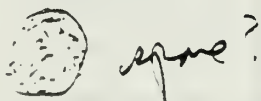
250
790
1040

NOTES:

Bacteria  



Protozoan: 1 2-3 per lens



ochromonas cl 1

* C0000 - no stain, spherical, unicell non flagellated

TOTAL UNITS COUNTED

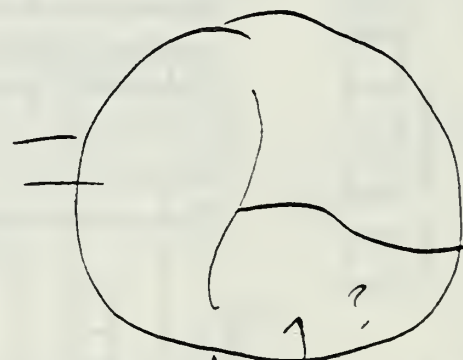
1 0 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSR



Palifer ?
zooplankton
47 times & more at 100x

Periphyton ☒ Phytoplankton

Sample

38/-180m Rep

Stage Reference

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

Reference Points

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

- ③ 16.0 (80 → 10)
- ④ 15.5 (70 → 80)
- ⑤ 15.0 (60 → 70)
- ⑥ 14.5 (70 → 80)
- ⑦ 14.0 (80 → 90)
- ⑧ 13.5 (70 → 74.7)

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | | Taxa Name | | Tally | Count |
|-----------|---|-----------|---|-------|-------|-----------|--|-----------|--|-------|-------|
| C | 0 | 0 | 0 | | | | | | | | |
| A | 6 | 7 | 6 | | | | | | | | |
| C | 1 | 8 | 0 | | | | | | | | |
| A | 8 | 4 | 3 | | | | | | | | |
| A | 4 | 1 | 0 | | | | | | | | |
| C | 3 | 1 | 0 | | | | | | | | |
| A | 3 | 1 | 7 | | | | | | | | |
| A | 1 | 6 | 7 | | | | | | | | |
| A | 3 | 7 | 3 | | | | | | | | |
| A | 7 | 9 | 8 | | | | | | | | |
| C | 1 | 8 | 8 | | | | | | | | |
| A | 3 | 7 | 0 | | | | | | | | |
| A | 6 | 3 | 1 | | | | | | | | |
| A | 8 | 2 | 0 | | | | | | | | |
| * 37 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 1, 15 | | | | | | | | | | | |
| 11, 1 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| -1, 6 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 1 | | | | | | | | | | | |

Reviewed by

Date

Complete Analysis

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 8 0 4 8 2

SAMPLE IDENTIFICATION

41 / -200m

SAMPLING DATE
Day Month Year

2 9 0 7 8 2

PROJECT

D 2921

TOTAL SAMPLE TRANSPORT VOLUME

1 0 4 4 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

2 5 0 : 2 5
X Y

- 6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 ml

SED. CHAMBER BOTTOM AREA

. 0 0 0 0 cm²

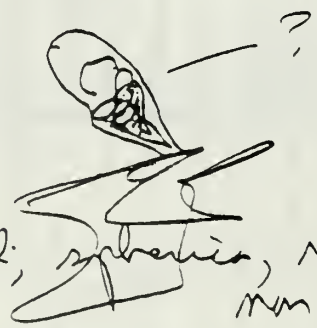
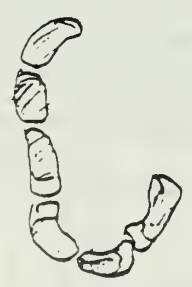
SED. CHAMBER BOTTOM AREA OBSERVED

. 0 0 0 0 cm²

250
790
1040

NOTES:

amvela: |||| } per transect
20-30 in cluster



spore

similar
cellular
content to
G1704

* C9000 = unicell, spherical, non-flagellated
non-stain cells

TOTAL UNITS COUNTED

1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

N S G

☐ Periphyton ☒ Phytoplankton

Sample

141 - 200 m Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

- ④ 16.0 (70 → 80)
- ⑤ 5.5 (80 → 90)
- ⑥ 15.0 (70 → 80)
- ⑦ 14.5 (80 → 90)
- ⑧ 4.0 (70 → 80)
- ⑨ 13.5 (80 → 90)

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | | Taxa Name | | Tally | Count |
|-----------|---|-----------|---|-------|-------|-----------|--|-----------|--|-------|-------|
| A | 1 | 6 | 7 | 0 | | | | | | | |
| A | 3 | 1 | 7 | 1 | 111 | | | | | | 4 |
| C | 3 | 0 | 0 | 0 | 1111 | | | | | | 5 |
| C | 0 | 0 | 0 | 0 | 40 | | | | | | 4 |
| A | 4 | 1 | 0 | 1 | 11 | | | | | | 2 |
| A | 1 | 8 | 0 | 1 | 8 | | | | | | 8 |
| A | 6 | 7 | 6 | 0 | 9 | | | | | | 9 |
| A | 2 | 7 | 3 | 0 | 1111 | | | | | | 7 |
| A | 6 | 6 | 2 | 3 | 11 | | | | | | 2 |
| A | 6 | 5 | 0 | 1 | 1 | | | | | | 1 |
| A | 8 | 4 | 0 | 0 | 1 | | | | | | 1 |
| A | 3 | 8 | 8 | 0 | 1 | | | | | | 1 |
| G | 1 | 7 | 0 | 4 | 11 | | | | | | 2 |
| A | 8 | 4 | 3 | 1 | 1 | | | | | | 1 |
| C | 1 | 8 | 0 | 2 | 2 | | | | | | 2 |

*

Reviewed by

Date

Sample Number

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
11 06 83

SAMPLE IDENTIFICATION

Surf

SAMPLING DATE
Day Month Year

25 08 81

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

1039 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1039 : 29
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

4.0 ml

SED. CHAMBER BOTTOM AREA

. cm²

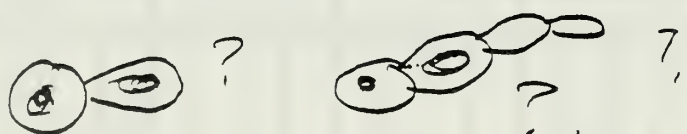
SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

x150
G1704
G2014

1010
29
1039



did not fit
cant appear to be algae(?)

3 seen

TOTAL UNITS COUNTED

1100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 0 0 6 8 3

SAMPLE IDENTIFICATION

-100 m

SAMPLING DATE
Day Month Year

2 5 0 8 9 1

PROJECT

D 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 0 4 2 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1 0 4 2 : 2 1 . 5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 0 ml

SED. CHAMBER BOTTOM AREA

1 0 0 0 0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1 0 0 0 0 cm²

NOTES:

X150



G1704

$$\begin{array}{r} 120.0 \\ 900.0 \\ 21.5 \\ \hline 1041.5 \end{array}$$

filament g
C9422

A1670 common

G2015

Bosmina



G0000

ferd pellets

bacteria: C



>
+11

TOTAL UNITS COUNTED

1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSG

Phytoplankton

| | |
|--------|-----|
| -100 m | Rep |
|--------|-----|

| |
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| |
| . |
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| | |
| | |

Reviewed by _____ Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 0 0 6 8 3

SAMPLE IDENTIFICATION

_ 200m

SAMPLING DATE
Day Month Year

2 5 0 8 8 1

PROJECT

D 2 4 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 0 5 0 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1 0 5 0 : 3 0 5

X

Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 0 ml

SED. CHAMBER BOTTOM AREA

5 0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

5 0 cm²

NOTES:

X150 G2015 curran

filaments C9422 ad A1670 curran

fecal pellet

spore pale green

00000
plate

spore
or halospora

190.0
830.0
30.5

1050.5

TOTAL UNITS COUNTED

1 1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSIG

Phytoplankton

③ 5.0 (70 — 71.6)

Stage Reference

Trans. Reference Points

Sample

W 952-1

12

[illegible]

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Java Code

[illegible]

Ан панапан

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED

| | | | | | | | | |
|-----|---|---|-------|---|---|------|--|--|
| Day | | | Month | | | Year | | |
| 1 | 0 | 0 | 6 | 8 | 3 | | | |

SAMPLE IDENTIFICATION

| | |
|----|---|
| Sw | 1 |
|----|---|

SAMPLING DATE
Day Month Year

| | | | | | |
|---|---|---|---|---|---|
| 1 | 1 | 0 | 8 | 8 | 1 |
|---|---|---|---|---|---|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | | |
|---|---|---|---|
| 5 | 1 | 1 | 1 |
|---|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | |
|---|---|---|---|--|---|---|
| 5 | 1 | 6 | : | | 3 | 1 |
| X | | | | | Y | |

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | |
|---|---|---|
| 5 | . | 0 |
|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | |
|---|--|--|--|--|
| . | | | | |
|---|--|--|--|--|

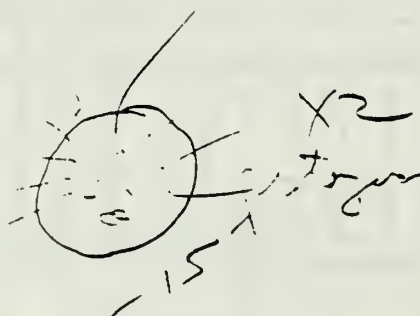
 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | |
|---|--|--|--|--|
| . | | | | |
|---|--|--|--|--|

 cm²

NOTES:

X150 no zoopl.
Q2014485.
31
516

TOTAL UNITS COUNTED

| | | |
|---|---|---|
| 1 | 0 | 0 |
|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 x

ANALYST

| | | |
|---|---|---|
| N | S | G |
|---|---|---|

Phytoplankton

(10.0)

Trans. Reference Points

1

130

| |
|--|
| |
| |
| |
| |
| |

[illegible]

Data

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 九十八
 九十九
 一百

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 0 0 6 8 3

SAMPLE IDENTIFICATION

Surf-2

SAMPLING DATE
Day Month Year

1 1 0 8 8 1

PROJECT

0 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

1 1 8 9 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

1 1 8 9 : 6 4
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 . 0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

X150 G2014 no zooplankton

numerous frustule;
Achnanthes exigua ??

an unpreserved sample
or preservative did not hold
bacteria not abundant?
also empty frustule;
Eurotia sp and Achnanthes sp
minutissima

TOTAL UNITS COUNTED

1 1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSG

strong to have all these
typically attached species;
diatoms.

255
870
64
1189

Phytoplankton

Rep

| |
|--|
| |
| |
| |
| |
| |

| | |
|--|--|
| | |
| | |
| | |
| | |

| Taxa Code | Taxa Name | Tally | Count |
|-----------|-----------|-------|-------|
| A80000 | | 1 | 1 |
| C00000 | | 48 | 48 |
| A60000 | | 22 | 22 |
| C00000 | | 10 | 10 |
| A80000 | | 10 | 9 |
| A30000 | | 1 | 1 |
| G10000 | | 3 | 3 |
| A90000 | | 1 | 1 |
| C10000 | | 2 | 2 |
| C10000 | | 1 | 1 |
| G10000 | | 1 | 1 |
| A60000 | | 1 | 1 |
| A30000 | | 1 | 1 |

Date _____

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year

| | | |
|----|----|----|
| 10 | 06 | 88 |
|----|----|----|

SAMPLE IDENTIFICATION

| |
|------------|
| -100 m / 1 |
|------------|

SAMPLING DATE
Day Month Year

| | | |
|----|----|----|
| 11 | 08 | 81 |
|----|----|----|

PROJECT

| | | | | |
|---|---|---|---|---|
| D | 2 | 9 | 2 | 1 |
|---|---|---|---|---|

TOTAL SAMPLE TRANSPORT VOLUME

| | | |
|---|---|---|
| 5 | 2 | 0 |
|---|---|---|

 ml

PREPARATION METHOD

| |
|---|
| 7 |
|---|

CONCENTRATION OR DILUTION RATIO

| | | | | | | | |
|---|---|---|---|--|--|---|---|
| 5 | 2 | 0 | : | | | 3 | 0 |
|---|---|---|---|--|--|---|---|

X Y

6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

| | | | | |
|--|--|---|---|---|
| | | 4 | • | 0 |
|--|--|---|---|---|

 ml

SED. CHAMBER BOTTOM AREA

| | | | | | |
|--|--|---|--|--|--|
| | | • | | | |
|--|--|---|--|--|--|

 cm²


SED. CHAMBER BOTTOM AREA OBSERVED

| | | | | | |
|--|--|---|--|--|--|
| | | • | | | |
|--|--|---|--|--|--|


 cm²

NOTES:

X150 Keratella
||||
G1704
G2015





||



||

fecal pellets
bacteria

TOTAL UNITS COUNTED

| | | | |
|--|---|---|---|
| | 1 | 0 | 0 |
|--|---|---|---|

MICROSCOPE MAGNIFICATION

| | | | |
|---|---|---|---|
| 1 | 5 | 0 | 0 |
|---|---|---|---|

 X

ANALYST

| | | | |
|---|---|---|---|
| N | S | T | W |
|---|---|---|---|

☐ Periphyton ☒ Phytoplankton

Sample

-100m
Rep

Stage Reference

| | | | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

Trans. Reference Points

| | | | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

Count

Tally

Taxa Name

Taxa Code

Count

Tally

Taxa Name

Taxa Code

| | | | | |
|---|---|---|---|---|
| C | 1 | 6 | 0 | 0 |
| A | 8 | 2 | 0 | 1 |
| A | 1 | 6 | 7 | 0 |
| G | 1 | 4 | 0 | 0 |
| C | 1 | 0 | 0 | 0 |
| A | 8 | 3 | 0 | 2 |
| C | 1 | 6 | 6 | 0 |
| C | 3 | 0 | 0 | 0 |
| C | 1 | 8 | 0 | 1 |
| A | 8 | 4 | 3 | 1 |
| C | 0 | 0 | 0 | 0 |
| A | 8 | 4 | 0 | 0 |
| A | 8 | 2 | 0 | 5 |
| G | 1 | 7 | 0 | 4 |
| A | 2 | 1 | 7 | 1 |

*

2

Reviewed by

Date

Sample Analysis

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSISDATE PERFORMED Day Month Year
100683

SAMPLE IDENTIFICATION

-100/2SAMPLING DATE
Day Month Year110881

PROJECT

D2921

TOTAL SAMPLE TRANSPORT VOLUME

526 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

526:23.5
X Y

6 = natural water

7 = concentration of sample (x = original sample volume
y = volume of concentrate)

8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5.0 ml

SED. CHAMBER BOTTOM AREA

1.0 cm²

SED. CHAMBER BOTTOM AREA OBSERVED

1.0 cm²

NOTES:

G2015

G1704

zoopl.Bosmina
Helicentha502.0
23.5
525.5Isotoma
pelletGooey
Spore

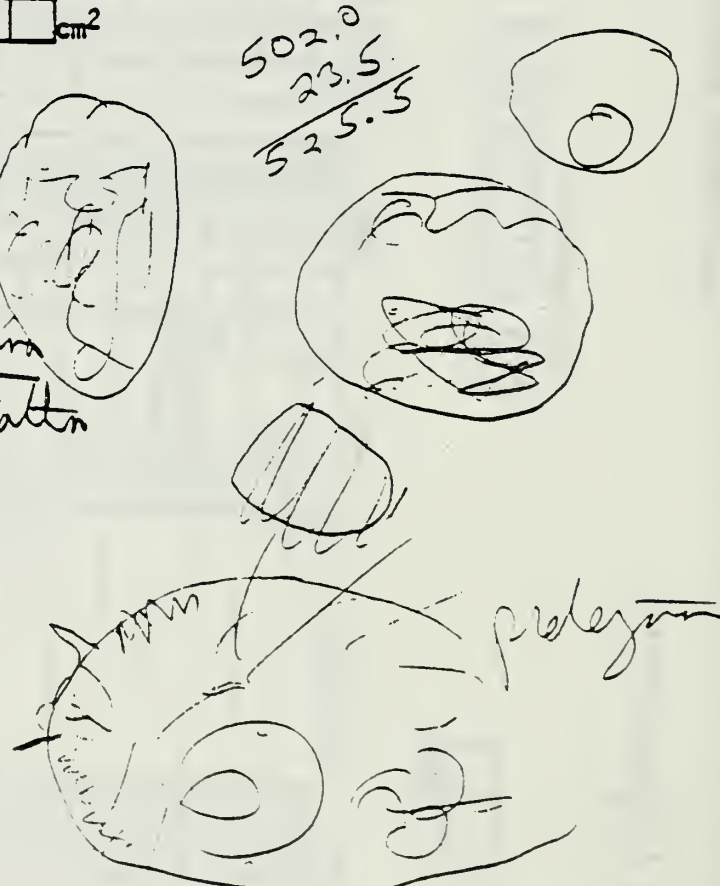
TOTAL UNITS COUNTED

100

MICROSCOPE MAGNIFICATION

1500 x

ANALYST

NSG

☐ Periphyton ☒ Phytoplankton

Sample

-100m/2 Rep

Stage Reference

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Trans. Reference Points

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

| Taxa Code | | Taxa Name | | Tally | Count | Taxa Code | | Taxa Name | | Tally | Count |
|-----------|----|-----------|---|-------|-------|-----------|--|-----------|--|-------|-------|
| G | 00 | 00 | 0 | | | | | | | | |
| A | 41 | 01 | | I | 1 | | | | | | |
| A | 31 | 17 | 0 | II | 2 | | | | | | |
| A | 84 | 06 | | III | 4 | | | | | | |
| C | 18 | 02 | | IV | 4 | | | | | | |
| C | 00 | 00 | | V | 6 | | | | | | |
| C | 00 | 00 | | VI | 2 | | | | | | |
| G | 14 | 00 | | VII | 4 | | | | | | |
| G | 14 | 04 | | VIII | 1 | | | | | | |
| A | 97 | 07 | | IX | 9 | | | | | | |
| A | 97 | 07 | | X | 2 | | | | | | |
| A | 63 | 01 | | XI | 1 | | | | | | |
| A | 83 | 01 | | XII | 4 | | | | | | |
| A | 27 | 00 | | XIII | 1 | | | | | | |
| A | 16 | 00 | | XIV | 1 | | | | | | |
| C | 00 | 00 | | XV | 5 | | | | | | |
| A | 83 | 04 | | XVI | 2 | | | | | | |
| C | 94 | 02 | | XVII | 1 | | | | | | |
| G | 20 | 10 | | XVIII | 1 | | | | | | |
| G | 14 | 05 | | XIX | 1 | | | | | | |

Reviewed by

Date

LABORATORY DATA REPORT
PHYTOPLANKTON ANALYSIS

DATE PERFORMED Day Month Year
1 0 0 6 8 3

SAMPLE IDENTIFICATION

-200 m

SAMPLING DATE
Day Month Year

1 1 0 8 8 1

PROJECT

D 2 9 2 1

TOTAL SAMPLE TRANSPORT VOLUME

5 3 5 ml

PREPARATION METHOD

7

CONCENTRATION OR DILUTION RATIO

5 3 5 : 2 3
X Y

- 6 = natural water
7 = concentration of sample (x = original sample volume
y = volume of concentrate)
8 = Dilution (x = volume of diluted sample; y = volume of original sample)

SED. CHAMBER VOLUME

5 . 0 ml

SED. CHAMBER BOTTOM AREA

. cm²

SED. CHAMBER BOTTOM AREA OBSERVED

. cm²

NOTES:

abundance of particulate
organic type detritus debris
fecal pellets

empty frustules of *Cocconeis* Common
Achnanthes
Nitzschia
empty loricae of *AP400* common

512
23
535

Preservation
failure?



TOTAL UNITS COUNTED

1 0 0

MICROSCOPE MAGNIFICATION

1 5 0 0 x

ANALYST

NSG

☒ Phytoplankton

(2) $16.0 \times 10^9 \rightarrow 11.5$

Stage Reference

Trans. Reference Points

Sample

-200m

Rep

Java code

Taxa Name

Count

Tally

Taxa Code

Taxa Name

[illegible]

Count

Reviewed by

Date _____

APPENDIX IV

Crater Lake National Park Chlorophyll a Analysis

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a ug/m |
|---------------------------------------|-----------------|---------------|--------------------|
| July 15 1982 | 13 | Surface | 175 |
| " | " | 20 m | < 293 |
| " | " | 40 m | 204 |
| " | " | 60 m | 268 |
| " | " | 80 m | 245 |
| " | " | 100 m | 722 |
| " | " | 120 m | 1,265 |
| " | " | 140 m | 965 |
| " | " | 160 m | 402 |
| " | " | 180 m | 528 |
| " | " | 200 m | 412 |
| July ²¹ 15 1982 | 13 | Surface | < 290 |
| " | " | Surface | 330 |
| " | " | 10 m | 310 |
| " | " | 10 m | 350 |
| " | " | 20 m | 365 |
| " | " | 20 m | 432 |
| " | " | 40 m | 291 |
| " | " | 40 m | 230 |
| " | " | 60 m | 385 |
| " | " | 60 m | 310 |
| " | " | 80 m | < 290 |
| " | " | 80 m | 405 |
| " | " | 100 m | 550 |
| " | " | 100 m | 582 |
| " | " | 120 m | 555 |
| " | " | 120 m | 475 |

Crater Lake National Park

Chlorophyll a Analyses

2

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a ug/m ³ |
|--------------|-----------------|---------------|---------------------------------|
| JULY 21 1982 | 13 | 140 m | <290 |
| " | " | 140 m | <290 |
| " | " | 160 m | 295 |
| " | " | 160 m | 420 |
| " | " | 180 m | 420 |
| " | " | 180 m | 385 |
| " | " | 200 m | <290 |
| " | " | 200 m | <290 |
| JULY 24 1982 | 23 | Surface | 385 |
| " | " | Surface | <290 |
| " | " | 10 m | 372 |
| " | " | 10 m | 445 |
| " | " | 20 m | <290 |
| " | " | 20 m | <290 |
| " | " | 40 m | <290 |
| " | " | 40 m | <290 |
| " | " | 60 m | <290 |
| " | " | 60 m | <290 |
| " | " | 80 m | 350 |
| " | " | 80 m | 291 |
| " | " | 100 m | 935 |
| " | " | 100 m | 1,000 |
| " | " | 120 m | 990 |
| " | " | 120 m | 1,000 |
| " | " | 140 m | 525 |
| " | " | 140 m | 475 |
| " | " | 160 m | 475 |
| " | " | 160 m | 472 |

(2)

Crater Lake National Park

Chlorophyll a Analyses

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a ug/m ³ |
|--------------|-----------------|---------------|---------------------------------|
| July 24 1982 | 23 | 180 m | 432 |
| " | " | 180 m | 475 |
| " | " | 200 m | 240 |
| " | " | 200 m | 240 |
| JULY 29 1982 | 13 | Surface | <290 |
| " | " | Surface | <290 |
| " | " | 10 m | <290 |
| " | " | 10 m | <290 |
| " | " | 20 m | <290 |
| " | " | 20 m | <290 |
| " | " | 40 m | <290 |
| " | " | 40 m | <290 |
| " | " | 60 m | 490 |
| " | " | 60 m | 240 |
| " | " | 80 m | 450 |
| " | " | 80 m | 291 |
| " | " | 100 m | 582 |
| " | " | 100 m | 700 |
| " | " | 120 m | 755 |
| " | " | 120 m | 645 |
| " | " | 140 m | <290 |
| " | " | 140 m | 298 |
| " | " | 160 m | 290 |
| " | " | 160 m | <290 |
| " | " | 180 m | 240 |
| " | " | 180 m | <290 |
| " | " | 200 m | <290 |
| " | " | 200 m | 466 |

(4)

Crater Lake National Park

Chlorophyll a Analyses

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a $\mu\text{g}/\text{m}^3$ |
|-------------|-----------------|---------------|--|
| Aug 5 1982 | 13 | Surface | 527 |
| " | " | Surface | 442 |
| " | " | 10 m | <261 |
| " | " | 10 m | <261 |
| " | " | 20 m | <290 |
| " | " | 20 m | <261 |
| " | " | 40 m | 290 |
| " | " | 40 m | 499 |
| " | " | 60 m | 499 |
| " | " | 60 m | 315 |
| " | " | 80 m | 261 |
| " | " | 80 m | <261 |
| " | " | 100 m | 470 |
| " | " | 100 m | 495 |
| " | " | 120 m | 410 |
| " | " | 120 m | 446 |
| " | " | 140 m | 276 |
| " | " | 140 m | 385 |
| " | " | 160 m | 261 |
| " | " | 160 m | 261 |
| " | " | 180 m | <276 |
| " | " | 180 m | <276 |
| " | " | 200 m | <290 |
| " | " | 200 m | <276 |
| Aug 23 1982 | 13 | Surface | <290 |
| " | " | Surface | <261 |

⑤

Crater Lake National Park

Chlorophyll a Analyses

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a $\mu\text{g}/\text{m}^3$ |
|---------------|-----------------|---------------|--|
| Aug 23, 1982 | 13 | 10 m | <276 |
| " | " | 10 m | <290 |
| " | " | 20 m | <261 |
| " | " | 20 m | <261 |
| " | " | 40 m | <276 |
| " | " | 40 m | <261 |
| " | " | 60 m | <261 |
| " | " | 60 m | <261 |
| " | " | 80 m | <261 |
| " | " | 80 m | 446 |
| " | " | 100 m | 693 |
| " | " | 100 m | 472 |
| " | " | 120 m | 873 |
| " | " | 120 m | 693 |
| " | " | 140 m | 525 |
| " | " | 140 m | 351 |
| " | " | 160 m | 276 |
| " | " | 160 m | 364 |
| " | " | 180 m | 423 |
| " | " | 180 m | <276 |
| " | " | 200 m | <290 |
| " | " | 200 m | <261 |
| Sept. 1, 1982 | 13 | Surface | <276 |
| " | " | Surface | 451 |
| " | " | 10 m | 300 |
| " | " | 10 m | 290 |
| " | " | 20 m | <290 |
| " | " | 20 m | <290 |

⑥

Crater Lake National Park

Chlorophyll a Analyses

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a $\mu\text{g}/\text{m}^3$ |
|--------------|-----------------|---------------|--|
| Sept. 1 1982 | 13 | 40 m | 2290 |
| " | " | 40 m | < 290 |
| " | " | 60 m | 290 |
| " | " | 60 m | 290 |
| " | " | 80 m | 290 |
| " | " | 80 m | 405 |
| " | " | 100 m | 650 |
| " | " | 100 m | 690 |
| " | " | 120 m | 575 |
| " | " | 120 m | 785 |
| " | " | 140 m | 790 |
| " | " | 140 m | 475 |
| " | " | 160 m | < 290 |
| " | " | 160 m | < 276 |
| " | " | 180 m | 366 |
| " | " | 180 m | 335 |
| " | " | 200 m | 423 |
| " | " | 200 m | 423 |
| Sept. 1 1982 | 23 | Surface | 332 |
| | | Surface | 358 |
| | | 10 m | 302 |
| | | 10 m | < 290 |
| | | 20 m | < 247 |
| | | 20 m | < 218 |
| | | 40 m | < 290 |
| | | 40 m | < 290 |
| | | 60 m | 455 |
| | | 60 m | 335 |

⑦

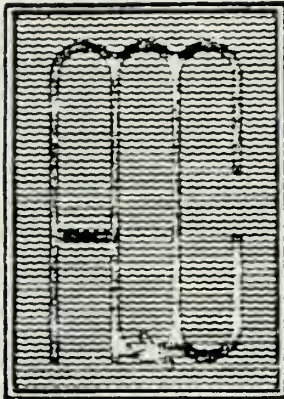
Crater Lake National Park

Chlorophyll a Analyses

| Sample Date | Station Sampled | Depth Sampled | Chlorophyll a $\mu\text{g}/\text{m}^3$ |
|---------------|-----------------|---------------|--|
| Sept. 1, 1982 | 23 | 80 m | 812 |
| " | " | 80 m | 675 |
| " | " | 100 m | 888 |
| " | " | 100 m | 815 |
| " | " | 120 m | 235 |
| " | " | 120 m | 505 |
| " | " | 140 m | 230 |
| " | " | 140 m | 350 |
| " | " | 160 m | < 290 |
| " | " | 160 m | 415 |
| " | " | 180 m | 276 |
| " | " | 180 m | 276 |
| " | " | 200 m | < 290 |
| " | " | 200 m | < 290 |
| Sept. 2, 1982 | 13 | Surface | < 290 |
| " | " | 40 m | 290 |
| " | " | 80 m | 465 |
| " | " | 100 m | 645 |
| " | " | 120 m | 640 |
| " | " | 160 m | 405 |
| " | " | 200 m | < 290 |

① ~~ASTM - 6415 for paper~~
② ~~NSG~~

NEWSLETTER ☆



Analytical Quality Control

U. S. ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY
CINCINNATI, OHIO 45268
PHONE: 513-684-7301

EDITOR

J. B. Anderson

October 1976

#31

New Regional Office Addresses

Region IV and Region VI have moved to new office locations.
The new office addresses are:

U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308
Phone: FTS 285-5727
Coml 404-526-5727

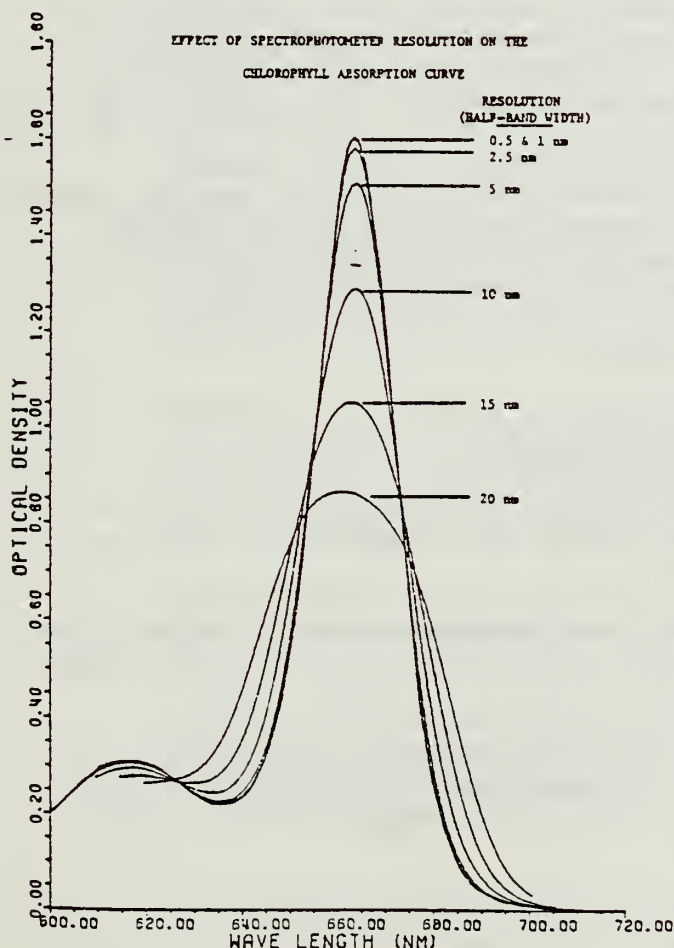
U.S. Environmental Protection Agency
Region VI
1201 Elm Street
First International Building
Dallas, Texas 75270
Phone: FTS 749-1962
Coml 214-749-1962

Air Quality Conference

ASTM Committee D.22 Conference on Air Quality Meterology and Atmospheric Ozone will meet at the University of Colorado, Boulder, Colorado, during the week of August 1, 1977. This

Effect of Spectrophotometer Resolution on Chlorophyll Measurements

Computer simulations of the absorption curve of a chlorophyll extract were prepared to demonstrate the effect of spectrophotometer resolution on the results of chlorophyll analyses. A 90% aqueous acetone chlorophyll solution was prepared using purified chlorophyll a obtained from the Sigma Chemical Company. The basic data employed in the simulation consisted of the optical densities (OD's) of this solution obtained at 1 nm intervals over the range 600 nm to 720 nm, using a Beckman ACTA V spectrophotometer which has a resolution better than 1 nm. These OD's were averaged, successively, by computer, over a broader and broader wavelength interval (2 nm, 3 nm, 4 nm....etc.) to a maximum interval of 40 nm, to simulate resolution over the full range available in instruments currently in use. The absorption curve was plotted and the apparent concentration of chlorophyll a was calculated at each simulated level of resolution, using the SCOR-UNESCO 1966 trichromatic equations (EPA Biological Methods Manual), and was expressed as percent recovery, compared to the concentration obtained with the original ACTA V data. These data compare favorably with the results obtained with laboratory instrumentation having advertised resolutions in the ranges simulated.



| Resolution (nm) (Half-band Width) | Recovery of Chl <u>a</u> (%) |
|--------------------------------------|---------------------------------|
| 0.1 | 100 |
| 1 | 99.6 |
| 2 | 98.8 |
| 10 | 78.6 |
| 15 | 62.0 |
| 20 | 43.5 |

(C. I. Weber, 513-684-7337)

2078/26/81

U.S. Environmental Protection Agency
Environmental Monitoring and Support Laboratory - Cincinnati

QC Samples for CHLOROPHYLL, SPECTROPHOTOMETRIC Analyses

CAUTION: READ INSTRUCTIONS CAREFULLY BEFORE OPENING AMPULS

I. GENERAL INSTRUCTIONS

The enclosed quality control sample for chlorophyll analysis by spectrophotometry consists of a sealed glass ampul, holding approximately 17 mL of a 90% aqueous acetone solution containing chlorophylls a, b, c and pheophytin a. Although the chlorophyll solution degrades rapidly at ambient light intensities and temperatures in the laboratory, the rate of decomposition is greatly reduced if the solution is protected from light and kept in a freezer. For this reason, the ampul was placed in a light-proof container to protect it from light. It should be kept in the screw-cap tube and stored in a freezer where the rate of decomposition is negligible. Vials, flasks, tubes and other laboratory glassware used to hold the chlorophyll samples during analyses must be covered with aluminum foil or other light barrier. If possible, work in subdued light.

The presence of chlorophyll degradation products, such as pheophytin a, can interfere with the estimates of the chlorophyll in the pigment extract. However, a correction can be made for pheophytin a by reading the optical density of the extract before and after acidification. These instructions are designed especially for this sample.

For a complete discussion of the methods used with natural samples, except for trichromatic equations listed on the data sheet, see the EPA methods manual: "Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents," USEPA, EMSL-Cincinnati, Ohio 45268 (EPA-670/4-73-001).

II. ANALYSES

Spectrophotometric Analysis, Concentrate 1

1. When ready to begin, remove the ampul from the freezer and allow it to warm to room temperature. Do not open the ampul until you are ready to analyze the content.
2. The cuvettes to be used should be cleaned meticulously, rinsed three times with 90% acetone solution, rinsed three times with 100% acetone and allowed to dry.
3. The 90% acetone solution to be used is prepared by adding 100 mL of water containing 15 drops of 1 normal sodium bicarbonate, to 900 mL of reagent grade acetone and mixing well. Note that final volume will be less than one liter.
4. Zero in the spectrophotometer with 90% acetone solution as appropriate for the instrument being used.

5. Break the neck of the ampul and pour the contents into a screw cap vial covered with aluminum foil.
6. Transfer approximately 4 mL from the vial to a 1 cm light path cuvette. Cover the cuvette, cap the vial and immediately read at the appropriate wavelengths of scan from 800 to 600 nm.
- 7.* Determine the optical density (OD) of the solution at 750, 664, 647 and 630 nm and record the data on the Data Sheet as the OD's read before acidification (750b, 664b, 647b and 630b).
8. To correct for pheophytin a, acidify the solution in the cuvette by adding 2 drops of 2N HCl; mix the solution well. Determine the OD at 750 nm and at 665 nm (pheophytin peak). Note the required change in wavelength from 664 to 665 nm.

It is important that the "after acidification" readings be made at least one minute but not more than two minutes after addition of the acid.

Record the readings on the Data Sheet as the OD's read after acidification (750a, 665a).

9. Discard the solution in the cuvette, rinse three times with 90% acetone solution, three times with 100% acetone and allow to dry.
10. Correct the OD's obtained before acidification by subtracting the OD750b from the OD664b and OD630b, insert the corrected OD's in the "trichromatic equations" on the Data Sheet, calculate the concentrations of chlorophyll a, b, and c in the solution, and record the values in Part D.1 of the Data Sheet.
11. Correct the OD reading at the 665 peak obtained after acidification by subtracting the OD750a reading. Insert the corrected OD664b and corrected OD665a in the Monochromatic equations on the Data Sheet, calculate the pheophytin a and chlorophyll a concentrations and record the data on Part D.2 of the Data Sheet.
12. A sealed sheet containing the statement of reference values is attached for use as you wish.

* from: Jeffrey, S. W., and Humphrey G. F., New Spectrophotometric Equations for Determining Chlorophylls a, b, c₁ and c₂ in Higher Plants, Algae, and Natural Phytoplankton, Biochem. Physiol. Pflanzen, 167: 191-194, 1975.

U.S. Environmental Protection Agency
Environmental Monitoring and Support Laboratory - Cincinnati

QC Samples for CHLOROPHYLL, SPECTROPHOTOMETRIC Analyses

REFERENCE VALUES

| mg/liter | | My values 12/16/82 | Expected Range* |
|--|---------------|-----------------------|--------------------|
| Chlorophyll, mg/liter Uncorrected for Pheophytin Trichromatic Method | Chl <u>a</u> | 8.11 7.40 | 8.00 - 8.22 |
| | Chl <u>b</u> | 1.76 0.78 | 1.18 - 2.33 |
| | Chl <u>c</u> | 0.62 1.25 | 0.35 - 0.87 |
| Chlorophyll, mg/liter Corrected for Pheophytin Monochromatic Method | Chl <u>a</u> | 7.15 6.81 | 6.95 - 7.36 |
| | Pheo <u>a</u> | 1.39 1.70 | 0.98 - 1.81 |

*Based on single laboratory data.

Received from
E Collins
27 Dec 1982

EPA

Reference Sample

DATA SHEET: QC Samples for CHLOROPHYLL, SPECTROPHOTOMETRIC Analyses

A. Optical densities (1 cm cell)

$$\frac{0.650}{OD664b} - \frac{0.005}{OD750b} = \frac{0.645}{\text{Corrected OD664}}$$

$$\frac{0.220}{OD647b} - \frac{0.005}{OD750b} = \frac{0.215}{\text{Corrected OD647}}$$

$$\frac{0.169}{OD630b} - \frac{0.005}{OD750b} = \frac{0.164}{\text{Corrected OD630}}$$

$$\frac{0.439}{OD665a} - \frac{0.02}{OD750a} = \frac{0.419}{\text{Corrected OD665}}$$

B. Trichromatic equations ~~(Jeffrey)~~ Jeffrey + Humphrey

Equations used to calculate chlorophyll concentrations using corrected OD's.

$$\begin{aligned} 1. \text{ Chlorophyll } a \text{ (mg/L)} &= 11.85(OD664) - 1.54(OD647) - 0.08(OD630) = 7.29 \\ &\quad 7.64 - 0.331 - 0.013 \\ 2. \text{ Chlorophyll } b \text{ (mg/L)} &= 21.03(OD647) - 5.43(OD664) - 2.65(OD630) = 0.58 \\ &\quad 4.52 - 3.50 - 0.436 \\ 3. \text{ Chlorophyll } c \text{ (mg/L)} &= 24.52(OD630) - 7.60(OD647) - 1.67(OD664) = 1.31 \\ &\quad 4.02 - 1.63 - 1.08 \end{aligned}$$

C. Monochromatic equations

Equations used to calculate the concentration of Chlorophyll a in the presence of Pheophytin a.

$$\begin{aligned} 1. \text{ Chlorophyll } a \text{ (mg/L)} &= 26.7(OD664b - OD665a) \\ &= 26.7(0.650 - 0.439) = 5.63 \\ 2. \text{ Pheophytin } a \text{ (mg/L)} &= 26.7 [1.7(OD665a) - (OD664b)] \\ &= 26.7 [1.7(0.439) - (0.650)] = 2.57 \end{aligned}$$

D. Pigment concentrations (mg/liter)

| | Chl a | Chl b | Chl c | Pheo a |
|----------------------------|-------|-------|-------|--------|
| 1. Trichromatic Equations | 7.29 | 0.58 | 1.31 | |
| 2. Monochromatic Equations | 5.63 | | | 2.57 |

Comments

Analyst/Laboratory

Location

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 1
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: Surface

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.024}{\text{OD 663}} - \frac{0.018}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 663}}$$

$$\frac{0.021}{\text{OD 645}} - \frac{0.018}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 645}}$$

$$\frac{0.021}{\text{OD 630}} - \frac{0.018}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.003}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 175

$$\frac{\text{Chl a } 0.070 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 2
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: Surface 20 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = < 299

$$\frac{\text{Chl a } 0.058 \times 10.1 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 3
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: 40 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.009}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 203.7 \cdot 204.

$$\text{Chl a } 0.081 \times \frac{5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 4
 Date Sampled: 7-15-1982
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: 60 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: y Paulin

A. Optical densities (1cm cell)

$$\frac{0.030}{\text{OD 663}} - \frac{0.019}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 663}}$$

$$\frac{0.029}{\text{OD 645}} - \frac{0.019}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

$$\frac{0.029}{\text{OD 630}} - \frac{0.019}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.1087

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 270.268

$$\text{Chl a } 0.1087 \times \frac{5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 5
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth = 80 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.019}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.098

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right)$$

$$3.116 - 0.019 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 245

$$\frac{\text{Chl a } 0.098 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.002} = \frac{\text{m}^3 = \text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 6
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth 100 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.052}{\text{OD 663}} - \frac{0.024}{\text{OD 750}} = \frac{0.028}{\text{Corrected OD 663}}$$

$$\frac{0.042}{\text{OD 645}} - \frac{0.024}{\text{OD 750}} = \frac{0.018}{\text{Corrected OD 645}}$$

$$\frac{0.040}{\text{OD 630}} - \frac{0.024}{\text{OD 750}} = \frac{0.016}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.289

$$11.64 \left(\frac{0.028}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.018}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.016}{\text{OD 630 (cor.)}} \right)$$

$$0.326 - 0.039 + 0.002$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 722

$$\frac{\text{Chl a } 0.289 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.002} = \frac{\text{m}^3 = \text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 7
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2.0cc
 Depth: 120 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.135}{\text{OD 663}} - \frac{0.085}{\text{OD 750}} = \frac{0.050}{\text{corrected OD 663}}$$

$$\frac{0.122}{\text{OD 645}} - \frac{0.085}{\text{OD 750}} = \frac{0.037}{\text{corrected OD 645}}$$

$$\frac{0.122}{\text{OD 630}} - \frac{0.085}{\text{OD 750}} = \frac{0.037}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) , 506

$$11.64 \left(\frac{0.050}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.037}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.037}{\text{OD 630 (cor.)}} \right)$$

0.582 0.080 + 0.004

C. Chlorophyll a, ug/m³ = 1265

$$\frac{\text{Chl a } 0.506 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.002} \quad \text{m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 8
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2. liter
 Depth: 140 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.120}{\text{OD 663}} - \frac{0.080}{\text{OD 750}} = \frac{0.040}{\text{Corrected OD 663}}$$

$$\frac{0.119}{\text{OD 645}} - \frac{0.080}{\text{OD 750}} = \frac{0.039}{\text{Corrected OD 645}}$$

$$\frac{0.121}{\text{OD 630}} - \frac{0.080}{\text{OD 750}} = \frac{0.041}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.386

$$11.64 \left(\frac{0.040}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.039}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.041}{\text{OD 630 (cor.)}} \right)$$

0.466 0.084 + 0.004

C. Chlorophyll a, ug/m³ = 965

$$\frac{\text{Chl a } 0.386 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.002} \quad \text{m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 9
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: 160 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulsen

A. Optical densities (1 cm cell)

$$\frac{0.065}{\text{OD 663}} - \frac{0.049}{\text{OD 750}} = \frac{0.016}{\text{corrected OD 663}}$$

$$\frac{0.061}{\text{OD 645}} - \frac{0.049}{\text{OD 750}} = \frac{0.012}{\text{corrected OD 645}}$$

$$\frac{0.060}{\text{OD 630}} - \frac{0.049}{\text{OD 750}} = \frac{0.011}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.161

$$11.64 \left(\frac{0.016}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.012}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.011}{\text{OD 630 (cor.)}} \right)}{0.186 - 0.026 + 0.001}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 402

$$\frac{\text{Chl a } 0.161 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 10
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: 180 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulsen

A. Optical densities (1cm cell)

$$\frac{0.072}{\text{OD 663}} - \frac{0.050}{\text{OD 750}} = \frac{0.022}{\text{Corrected OD 663}}$$

$$\frac{0.072}{\text{OD 645}} - \frac{0.050}{\text{OD 750}} = \frac{0.022}{\text{Corrected OD 645}}$$

$$\frac{0.079}{\text{OD 630}} - \frac{0.050}{\text{OD 750}} = \frac{0.029}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.211

$$11.64 \left(\frac{0.022}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.022}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.029}{\text{OD 630 (cor.)}} \right)}{0.256 - 0.048 + 0.003}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ = 528

$$\frac{\text{Chl a } 0.211 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.002} \text{ m}^3 = \frac{\text{sample volume filtered } 2 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 11
 Date Sampled: 7-15-82
 Station Sampled: 13
 Volume Sampled: 2 liter
 Depth: 200 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1 cm cell)

$$\frac{0.081}{\text{OD 663}} - \frac{0.062}{\text{OD 750}} = \frac{0.019}{\text{corrected OD 663}}$$

$$\frac{0.089}{\text{OD 645}} - \frac{0.062}{\text{OD 750}} = \frac{0.027}{\text{corrected OD 645}}$$

$$\frac{0.085}{\text{OD 630}} - \frac{0.062}{\text{OD 750}} = \frac{0.023}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = 0.165

$$11.64 \left(\frac{0.019}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.027}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.023}{\text{OD 630 (cor.)}} \right)}{0.221 - 0.058 + 0.002}$$

C. Chlorophyll a, ug/m³ = 412

$$\text{Chl a } 0.165 \times 5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered } 21}{\text{Volume of sample, m}^3 \quad 0.002 \quad 1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 12
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 663}}$$

$$\frac{0.005}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

$$\frac{0.005}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) = < 0.058

$$11.64 \left(\frac{0.058}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.058}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.058}{\text{OD 630 (cor.)}} \right)}{0.058 - 0.058 + 0.0005}$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a } 0.058 \times 5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1}{\text{Volume of sample, m}^3 \quad 0.001 \quad 1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 13
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 7 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: y Paula

A. Optical densities (1 cm cell)

$$\frac{0.006}{\text{OD 663}} - \frac{0.004}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 663}}$$

$$\frac{0.006}{\text{OD 645}} - \frac{0.004}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.006}{\text{OD 630}} - \frac{0.004}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.002}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} = \frac{\text{m}^3 = \text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 14
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 10 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.045
 Personnel: y Paula

A. Optical densities (1cm cell)

$$\frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.002}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} = \frac{\text{m}^3 = \text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 12
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 10 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1 cm cell)

$$\frac{0.004}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 663}}$$

$$\frac{0.003}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 16
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 20 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1cm cell)

$$\frac{0.004}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.004}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 17
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 20 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1 cm cell)

$$\frac{0.004}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\text{Chl a} = \frac{0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 18
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1 cm cell)

$$\frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\text{Chl a} = \frac{0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 19
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.002}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{0.058}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) < 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 20
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 663}}$$

$$\frac{0.009}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right) = 0.098$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 490

$$\frac{\text{Chl a } 0.098 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 21
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: 4 Paulin

A. Optical densities (1 cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.005}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 645}}$$

$$\frac{0.008}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.048

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

$$0.058 - 0.011 + 0.007$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 240

$$\frac{\text{Chl a } 0.048 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 22
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 30 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: 4 Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 663}}$$

$$\frac{0.008}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.007}{\text{Corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.090

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

$$0.105 - 0.015$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 450

$$\frac{\text{Chl a } 0.090 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 23
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.004}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 291

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 24
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.020}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 663}}$$

$$\frac{0.011}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.116

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 582

$$\frac{\text{Chl a } 0.116 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 25
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.012}{\text{corrected OD 663}}$$

$$\frac{0.011}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.140

$$11.64 \left(\frac{0.012}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.140$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 700

$$\frac{\text{Chl a } 0.140 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{m}^3 = \text{sample volume filtered} / 1000}{\text{L}}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 26
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 5-19-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.019}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.014}{\text{Corrected OD 663}}$$

$$\frac{0.011}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.151

$$11.64 \left(\frac{0.014}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right) = 0.151$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 755

$$\frac{\text{Chl a } 0.151 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{m}^3 = \text{sample volume filtered} / 1000}{\text{L}}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 27
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.021}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.013}{\text{corrected OD 663}}$$

$$\frac{0.018}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.129

$$11.64 \left(\frac{0.013}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.003}{\text{OD 630 (cor.)}} \right) = 0.129$$

C. Chlorophyll a, ug/m³ 645

$$\frac{\text{Chl a } 0.129 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 28
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.011}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 29
 Date Sampled: 7-29-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.001}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.006}{\text{corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.060

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 246 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right) = 0.070 - 0.011 + 0.0005 = 0.0595$$

C. Chlorophyll a, ug/m³

$$\text{Chl a } 0.060 \times 5 \text{ extract volume, ml} = 298 \text{ ug/m}^3$$

$$\text{Volume of sample, m}^3 \text{ } 0.001 \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 30
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.015}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 663}} \\ \frac{0.012}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.002}{\text{Corrected OD 645}} \\ \frac{0.011}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, ug/m³

$$\text{Chl a } 0.058 \times 205 \text{ extract volume, ml} = 290 \text{ ug/m}^3$$

$$\text{Volume of sample, m}^3 \text{ } 0.001 \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 31
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 645}} \\ \frac{0.011}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \frac{0.10}{\left(\frac{\quad}{\text{OD 630 (cor.)}} \right)}$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a} \frac{0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 32
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 180 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 663}} \\ \frac{0.015}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.048

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - \frac{0.058}{0.011} - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ = 240

$$\text{Chl a} \frac{0.048 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 33
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 180 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.000}{\text{corrected OD 663}}$$

$$\frac{0.012}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.000}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 34
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.00}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 35
 Date Sampled: 7-29-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-9-83
 Date Absorbance Read: 5-10-83
 Filter Size (micron): 0.45
 Personnel: y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 663}}$$

$$\frac{0.005}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 645}}$$

$$\frac{0.005}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.093

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 466

$$\frac{\text{Chl a } 0.093 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 36
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.011}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.016}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 37
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.018}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.018}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.012}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.066

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - \frac{0.081}{0.015} = 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ = 330

$$\text{Chl a } 0.066 \times 5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 38
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 10 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.018}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.007}{\text{Corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 645}}$$

$$\frac{0.016}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.062

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - \frac{0.081}{0.019} = 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ = 310

$$\text{Chl a } 0.02 \times 5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 39
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 10 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.026}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.006}{\text{corrected OD 663}} \\ \frac{0.022}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 645}} \\ \frac{0.021}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.070$$

C. Chlorophyll a, ug/m³ 350

$$\text{Chl a } 0.070 \times \frac{\text{extract volume, ml}}{\text{Volume of sample, m}^3} \times \frac{1000}{\text{sample volume filtered, L}} = \text{Chl a concentration}$$

0.001 1

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 40
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 20 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.019}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 663}} \\ \frac{0.021}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} & = & \frac{0.010}{\text{Corrected OD 645}} \\ \frac{0.020}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} & = & \frac{0.009}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.072

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.072$$

0.093 0.022 0.001

C. Chlorophyll a, ug/m³ 365

$$\text{Chl a } 0.072 \times \frac{\text{extract volume, ml}}{\text{Volume of sample, m}^3} \times \frac{1000}{\text{sample volume filtered, L}} = \text{Chl a concentration}$$

0.001 1

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 41
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: G. Paulin

Depth 20 m

A. Optical densities (1 cm cell)

$$\frac{0.019}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 663}}$$

$$\frac{0.019}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 645}}$$

$$\frac{0.018}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.086

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right) = 0.086$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 432

$$\frac{\text{Chl a } 0.086 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 42
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: G. Paulin

Depth: 40 m

A. Optical densities (1 cm cell)

$$\frac{0.015}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.011}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 291

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 43
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

Depth: 40 m

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.021}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.046

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

0.058 0.013 0.0005

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 230

$$\frac{\text{Chl a } 0.046 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 44
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

Depth: 60 m

A. Optical densities (1cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.012}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.012}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.012}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.077

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

0.093 0.017 0.001

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 385

$$\frac{\text{Chl a } 0.077 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 45
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.014}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.014}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.014}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.062

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)}{0.070} = 0.013 + 0.0005$$

C. Chlorophyll a, ug/m³ 310

$$\frac{\text{Chl a } 0.062 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 46
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

A. Optical densities (1cm cell)

$$\frac{0.040}{\text{OD 663}} - \frac{0.039}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.038}{\text{OD 645}} - \frac{0.039}{\text{OD 750}} = \frac{-}{\text{Corrected OD 645}}$$

$$\frac{0.032}{\text{OD 630}} - \frac{0.039}{\text{OD 750}} = \frac{-}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.053

$$11.64 \left(\frac{-}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{-}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{-}{\text{OD 630 (cor.)}} \right)}{0.070} =$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.053 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 47
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.028}{\text{OD 663}} - \frac{0.021}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.022}{\text{OD 645}} - \frac{0.021}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 645}}$$

$$\frac{0.021}{\text{OD 630}} - \frac{0.021}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) \frac{0.081}{0.081} + 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 405

$$\frac{\text{Chl a } 0.081 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 48
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.021}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 663}}$$

$$\frac{0.019}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.11

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) \frac{0.128}{0.128} + 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) \frac{0.019}{0.019} + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right) \frac{0.001}{0.001}$$

C. Chlorophyll a, ug/m³ 550

$$\frac{\text{Chl a } 0.11 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 49
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.019}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 663}} \\ \frac{0.012}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.116

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.116$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 582

$$\frac{\text{Chl a } 0.116 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 50
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.021}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.011}{\text{Corrected OD 663}} \\ \frac{0.018}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 645}} \\ \frac{0.011}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.111

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.111$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 555

$$\frac{\text{Chl a } 0.111 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 51
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.095$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.095 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 52
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.011}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{0.001}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 53
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 645}} \\ \frac{0.009}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } < 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 54
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.006}{\text{Corrected OD 663}} \\ \frac{0.009}{\text{OD 645}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \\ \frac{0.008}{\text{OD 630}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.059

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

0.070 0.011

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 295

$$\frac{\text{Chl a } 0.059 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 55
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth 160 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\frac{0.039}{\text{OD 663}} - \frac{0.030}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 663}}$$

$$\frac{0.040}{\text{OD 645}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.040}{\text{OD 630}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.084

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)}{0.105 - 0.022 + 0.001}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 420

$$\frac{\text{Chl a } 0.084 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 56
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth 180 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\frac{0.039}{\text{OD 663}} - \frac{0.030}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 663}}$$

$$\frac{0.040}{\text{OD 645}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

$$\frac{0.040}{\text{OD 630}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.084

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)}{0.105 - 0.022 + 0.001}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 420

$$\frac{\text{Chl a } 0.084 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 57
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth : 180 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.028}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 663}}$$

$$\frac{0.028}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 645}}$$

$$\frac{0.028}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.077

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

$$0.093 - 0.017 + 0.001$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.077 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 58
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth : 200 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 59
 Date Sampled: 7-21-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 663}} \\ \frac{0.009}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 60
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: Surface
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.077

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 385

$$\frac{\text{Chl a } 0.077 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 67
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth Surface
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\begin{array}{rcl} \frac{0.004}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.004}{\text{corrected OD 663}} \\ \frac{0.009}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.009}{\text{corrected OD 645}} \\ \frac{0.009}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.009}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a} < 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 62
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth 10 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\begin{array}{rcl} \frac{0.018}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 663}} \\ \frac{0.019}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.009}{\text{Corrected OD 645}} \\ \frac{0.015}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.074

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 372

$$\frac{\text{Chl a } 0.074 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 63
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth: 10 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 663}}$$

$$\frac{0.009}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.089$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.089 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000} = 445$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 64
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth: 20 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's)

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right) < 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000} < 290$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 65
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth 20 m
 A. Optical densities (1 cm cell)

$$\begin{array}{rclcl} \frac{0.0}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a} = \frac{0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 66
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth 40 m
 A. Optical densities (1cm cell)

$$\begin{array}{rclcl} \frac{0.001}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 663}} \\ \frac{0.001}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \\ \frac{0.001}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a} = \frac{0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} / \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 67
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1 cm cell)

$$\begin{array}{rclcl} \frac{0.0}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 68
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: G. Paulsen

A. Optical densities (1cm cell)

$$\begin{array}{rclcl} \frac{0.0}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 69
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.003}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 298

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 70
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.015}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 350

$$\frac{\text{Chl a } 0.070 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 71
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 80 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.010}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.009}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 645}}$$

$$\frac{0.009}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

0.058

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 291

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 72
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 100 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-82
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.030}{\text{OD 663}} - \frac{0.012}{\text{OD 750}} = \frac{0.018}{\text{Corrected OD 663}}$$

$$\frac{0.023}{\text{OD 645}} - \frac{0.012}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.012}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.187

$$11.64 \left(\frac{0.018}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

0.200 - 0.024 + 0.001

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 935

$$\frac{\text{Chl a } 0.187 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \cdot 0.001} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 73
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 100 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rclcl} \frac{0.029}{\text{OD 663}} & - & \frac{0.010}{\text{OD 750}} & = & \frac{0.019}{\text{corrected OD 663}} \\ \frac{0.020}{\text{OD 645}} & - & \frac{0.010}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 645}} \\ \frac{0.020}{\text{OD 630}} & - & \frac{0.010}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.20

$$11.64 \left(\frac{0.019}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right) = 0.221$$

C. Chlorophyll a, ug/m³

$$\text{Chl a } 0.20 \times 5 \text{ extract volume, ml} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000} \text{ m}^3$$

Volume of sample, m³ 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 74
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 120 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rclcl} \frac{0.030}{\text{OD 663}} & - & \frac{0.011}{\text{OD 750}} & = & \frac{0.019}{\text{Corrected OD 663}} \\ \frac{0.020}{\text{OD 645}} & - & \frac{0.011}{\text{OD 750}} & = & \frac{0.011}{\text{Corrected OD 645}} \\ \frac{0.020}{\text{OD 630}} & - & \frac{0.011}{\text{OD 750}} & = & \frac{0.009}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mcg/l (corrected OD's) 0.198

$$11.64 \left(\frac{0.019}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.221$$

C. Chlorophyll a, ug/m³

$$\text{Chl a } 0.198 \times 5 \text{ extract volume, ml} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000} \text{ m}^3$$

Volume of sample, m³ 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 75
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 120 m
 A. Optical densities (1 cm cell)

$$\frac{0.029}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.019}{\text{corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) .20

$$11.64 \left(\frac{0.019}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)$$

$$\frac{0.22}{1,000} - 0.022 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.20 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 76
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 140 m
 A. Optical densities (1cm cell)

$$\frac{0.021}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 663}}$$

$$\frac{0.021}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.105

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right)$$

$$\frac{0.128}{525} - 0.024 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.105 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 77
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth 140 m
 A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.028}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.095

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)$$

$$0.116 - 0.022 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.095 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

475 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 78
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth 160 m
 A. Optical densities (1cm cell)

$$\frac{0.040}{\text{OD 663}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 663}}$$

$$\frac{0.040}{\text{OD 645}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

$$\frac{0.040}{\text{OD 630}} - \frac{0.030}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.095

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.095 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

475 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 79
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 160 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.029}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 663}}$$

$$\frac{0.025}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 645}}$$

$$\frac{0.025}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.094

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³

472

$$\frac{\text{Chl a } 0.094 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 80
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 180 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.029}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 663}}$$

$$\frac{0.029}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 645}}$$

$$\frac{0.025}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.086

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³

432

$$\frac{\text{Chl a } 0.086 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 81
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 180

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.020}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.016}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.095

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right)$$

0.116 - 0.022 + 0.001

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 475

$$\frac{\text{Chl a } 0.095 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 82
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.048

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

0.058 - 0.011 + 0.0005

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 228 240

$$\frac{\text{Chl a } 0.048 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 83
 Date Sampled: 7-24-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

A. Optical densities (1 cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 645}}$$

$$\frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.048

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 240

$$\frac{\text{Chl a } 0.048 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 84
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 5-16-83
 Date Absorbance Read: 5-17-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

A. Optical densities (1cm cell)

$$\frac{0.010}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.000}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 645}}$$

$$\frac{0.005}{\text{OD 630}} - \frac{0.000}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.117

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{-}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

0.116 + 0.0005

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 527

$$\frac{\text{Chl a } 0.117 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 85 Date Extract Started: 5-23-83
 Date Sampled: 5-24-82 ⁸⁻⁵⁻⁸² Date Absorbance Read: 5-24-83
 Station Sampled: 23 13 Filter Size (micron): 0.45
 Volume Sampled: 1 liter Personnel: Y. Paulin
 Depth: Surface

A. Optical densities (1 cm cell)

$$\frac{0.008}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.093

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right) = 0.093$$

C. Chlorophyll a, ug/m³ 442

$$\frac{\text{Chl a } 0.093 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 86 Date Extract Started: 5-23-83
 Date Sampled: 8-5-82 Date Absorbance Read: 5-24-83
 Station Sampled: 13 Filter Size (micron): 0.45
 Volume Sampled: 1 liter Personnel: Y. Paulin
 Depth: 10 m

A. Optical densities (1cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 261

$$\frac{\text{Chl a } < 0.58 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 87
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: 10 m

A. Optical densities (1 cm cell)

$$\frac{0.001}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 261

$$\text{Chl a} < 0.058 \times \frac{4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 88
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: 20 m

A. Optical densities (1cm cell)

$$\frac{0.001}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.000}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.000}{\text{OD 630}} - \frac{0.000}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a} < 0.058 \times \frac{5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 89
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 20 m

A. Optical densities (1 cm cell)

$$\begin{array}{rclcl} \frac{0.001}{\text{OD 663}} & - & \frac{0.000}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} & - & \frac{0.000}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} & - & \frac{0.000}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 261

$$\frac{\text{Chl a } < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 90
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 40 m

A. Optical densities (1cm cell)

$$\begin{array}{rclcl} \frac{0.005}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 663}} \\ \frac{0.004}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 645}} \\ \frac{0.00}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.004}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 91
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-84
 Filter Size (micron): 0.45
 Personnel: J Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.008}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.009}{\text{corrected OD 663}} \\ \frac{0.009}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.009}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.105

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.105$$

C. Chlorophyll a, ug/m³ 499

$$\frac{\text{Chl a } 0.105 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 92
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.009}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.009}{\text{Corrected OD 663}} \\ \frac{0.004}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 645}} \\ \frac{0.004}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.105

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.105$$

C. Chlorophyll a, ug/m³ 499

$$\frac{\text{Chl a } 0.105 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 93
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 60 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.006}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.006}{\text{corrected OD 663}} \\ \frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 645}} \\ \frac{0.002}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.070$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\text{Chl a } 0.070 \times 4.5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 94
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 80 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 663}} \\ \frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \\ \frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\text{Chl a } 0.058 \times 4.5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 95
 Date Sampled: 2-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.004}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.004}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 50.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 261

$$\frac{\text{Chl a } -0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 96
 Date Sampled: 2-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.010}{\text{Corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.010}{\text{Corrected OD 645}} \\ \frac{0.000}{\text{OD 630}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.094

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

0.116 0.022

C. Chlorophyll a, ug/m³ 470

$$\frac{\text{Chl a } 0.094 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 97
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 100 m
 A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 663}} \\ \frac{0.008}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.008}{\text{corrected OD 645}} \\ \frac{0.000}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.099

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right) = 0.116 - 0.017 = 0.099$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\text{Chl a } 0.099 \times 5.0 \text{ extract volume, ml} \div \text{Volume of sample, m}^3 = \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \div \text{L}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 98
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 120 m
 A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.008}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 663}} \\ \frac{0.005}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.082

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right) = 0.093 - 0.011 = 0.082$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\text{Chl a } 0.082 \times 5 \text{ extract volume, ml} \div \text{Volume of sample, m}^3 = \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \div \text{L}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 99
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Pauline

$$\begin{array}{rcl} \frac{0.009}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.009}{\text{corrected OD 663}} \\ \frac{0.005}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 645}} \\ \frac{0.000}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.094

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)}{0.011} = 0.105$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 446

$$\frac{\text{Chl a } 0.094 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 100
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Pauline

$$\begin{array}{rcl} \frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)}{0.058} = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 276

$$\frac{\text{Chl a } 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 101
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 14.3 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

A. Optical densities (1 cm cell)

$$\frac{0.008}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.0}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.0}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - \frac{0.081}{0.007} \times 216 \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 385

$$\frac{\text{Chl a } 0.081 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.007} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 102
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

A. Optical densities (1 cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.000}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - \frac{0.058}{0.005} \times 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 261

$$\frac{\text{Chl a } 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 103
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 160 m
 A. Optical densities (1 cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 261

$$\text{Chl a } 0.058 \times 4.05 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 104
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 180 m
 A. Optical densities (1cm cell)

$$\frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 663}}$$

$$\frac{0.000}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

$$\frac{0.000}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.001}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 276

$$\text{Chl a } 0.058 \times 4.75 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 105
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulsen

Depth: 180 m
 A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 276

$$\frac{\text{Chl a } < 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 106
 Date Sampled: 8-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulsen

Depth: 200 m
 A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 107
 Date Sampled: 2-5-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: G Paulsen

Depth 200 m
 A: Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 276

$$\text{Chl a} = \frac{0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 108
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: G Paulsen

Depth Surface
 A: Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\text{Chl a} = \frac{0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 109
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

Depth: surface

A. Optical densities (1 cm cell)

$$\frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 663}}$$

$$\frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 261

$$\frac{\text{Chl a } < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.007} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 110
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

Depth: 10 m

A. Optical densities (1cm cell)

$$\frac{0.002}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.00}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.0}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 276

$$\frac{\text{Chl a } < 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.007} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 111
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth 10 m

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \frac{0.10}{\left(\frac{\quad}{\text{OD 630 (cor.)}} \right)}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 112
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth 20 m

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\frac{\text{Chl a } < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 113
 Date Sampled: 7-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

Depth: 80 m

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.0}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\text{Chl a} = \frac{0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 114
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

Depth: 40 m

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.003}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.003}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{0.003}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 276

$$\text{Chl a} = \frac{0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 115
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 40 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\begin{array}{rcl} \frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 663}} \\ \frac{0.000}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.00}{\text{corrected OD 645}} \\ \frac{0.000}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\text{Chl a } \frac{0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 116
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: J. Paulin

$$\begin{array}{rcl} \frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\text{Chl a } \frac{0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 117
 Date Sampled: 2-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.003}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 663}} \\ \frac{0.028}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.028}{\text{corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{corrected OD 663}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{corrected OD 645}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{corrected OD 630}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\frac{\text{Chl a} < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 118
 Date Sampled: 2-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.001}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.0}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{corrected OD 663}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{corrected OD 645}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{corrected OD 630}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\frac{\text{Chl a} < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 119
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.010}{\text{OD 663}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 663}} \\ \frac{0.008}{\text{OD 645}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.008}{\text{corrected OD 645}} \\ \frac{0.003}{\text{OD 630}} - \frac{0.000}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.099

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.003}{\text{OD 630 (cor.)}} \right) = 0.116 - 0.017 = 0.099$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 446

$$\text{Chl a } 0.099 \times 4.5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 120
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\begin{array}{rcl} \frac{0.020}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.015}{\text{Corrected OD 663}} \\ \frac{0.015}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.010}{\text{Corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.154

$$11.64 \left(\frac{0.015}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right) = 0.175 - 0.022 = 0.154$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 693

$$\text{Chl a } 0.154 \times 4.5 \text{ extract volume, ml} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

Volume of sample, m^3 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 121
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rclcl} \frac{0.015}{\text{OD 663}} & - & \frac{0.005}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} & - & \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 645}} \\ \frac{0.009}{\text{OD 630}} & - & \frac{0.005}{\text{OD 750}} & = & \frac{0.004}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.105

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.004}{\text{OD 630 (cor.)}} \right) = 0.105$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.105 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 122
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rclcl} \frac{0.020}{\text{OD 663}} & - & \frac{0.002}{\text{OD 750}} & = & \frac{0.018}{\text{Corrected OD 663}} \\ \frac{0.010}{\text{OD 645}} & - & \frac{0.002}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 645}} \\ \frac{0.009}{\text{OD 630}} & - & \frac{0.002}{\text{OD 750}} & = & \frac{0.007}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.194

$$11.64 \left(\frac{0.018}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.007}{\text{OD 630 (cor.)}} \right) = 0.194$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.194 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 123
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 120 m
 A. Optical densities (1 cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.020}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.015}{\text{corrected OD 663}} \\ \frac{0.015}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 645}} \\ \frac{0.010}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.154

$$11.64 \left(\frac{0.015}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)}{0.175} = 0.154$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.154 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 124
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 140 m
 A. Optical densities (1cm cell)

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.009}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.009}{\text{Corrected OD 663}} \\ \frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \\ \frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.105

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)}{0.105} = 0.105$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.105 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 125
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 140 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.009}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 663}}$$

$$\frac{0.008}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.078

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 351

$$\frac{\text{Chl a } 0.078 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / 1000}{0.001} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 126
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth 160 m

Date Extract Started: 5-23-83
 Date Absorbance Read: 5-24-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.005}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.001}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.001}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.001}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 276

$$\frac{\text{Chl a } 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / 1000}{0.001} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 127
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth - 160 m

Date Extract Started: 5-23-82
 Date Absorbance Read: 5-24-82
 Filter Size (micron): 0.45
 Personnel: J. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.009}{\text{OD 663}} - \frac{0.002}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.002}{\text{OD 645}} - \frac{0.002}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.002}{\text{OD 630}} - \frac{0.002}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - \frac{216}{0.081} \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.0}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³364

$$\frac{\text{Chl a } 0.081 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 128
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth - 180 m

Date Extract Started: 5-23-82
 Date Absorbance Read: 5-24-82
 Filter Size (micron): 0.45
 Personnel: J. Paulin

A. Optical densities (1cm cell)

$$\frac{0.008}{\text{OD 663}} - \frac{0.00}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 645}}$$

$$\frac{0.005}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.094

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - \frac{216}{0.093} \left(\frac{0.0}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³423

$$\frac{\text{Chl a } 0.094 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 129
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 180 m

Date Extract Started: 5-23-82
 Date Absorbance Read: 5-24-82
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rclcl} \frac{0.002}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 663}} \\ \frac{0.0}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{corrected OD 645}} \\ \frac{0.001}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 276

$$\text{Chl a} = \frac{0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 130
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-23-82
 Date Absorbance Read: 5-24-82
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rclcl} \frac{0.002}{\text{OD 663}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.002}{\text{Corrected OD 663}} \\ \frac{0.000}{\text{OD 645}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.000}{\text{OD 630}} & - & \frac{0.0}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\text{OD 663 (cor.)}}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\text{OD 645 (cor.)}}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\text{OD 630 (cor.)}}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\text{Chl a} = \frac{0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 131
 Date Sampled: 8-23-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 5-23-82
 Date Absorbance Read: 5-24-82
 Filter Size (micron): 0.45
 Personnel: G. Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.002}{\text{OD 663}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 663}} \\ \frac{0.005}{\text{OD 645}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 645}} \\ \frac{0.002}{\text{OD 630}} - \frac{0.0}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 261

$$\frac{\text{Chl a } < 0.058 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 132
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.012}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 663}} \\ \frac{0.013}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \\ \frac{0.013}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 276

$$\frac{\text{Chl a } < 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 133
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: J. Paulson

A. Optical densities (1 cm cell)

$$\frac{0.055}{\text{OD 663}} - \frac{0.045}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.055}{\text{OD 645}} - \frac{0.045}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 645}}$$

$$\frac{0.054}{\text{OD 630}} - \frac{0.045}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.095

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.009}{\text{OD 630 (cor.)}} \right) = 0.116 - 0.022 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 451

$$\frac{\text{Chl a } 0.095 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 134
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 10 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: J. Paulson

A. Optical densities (1cm cell)

$$\frac{0.025}{\text{OD 663}} - \frac{0.019}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 663}}$$

$$\frac{0.024}{\text{OD 645}} - \frac{0.019}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

$$\frac{0.025}{\text{OD 630}} - \frac{0.019}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.06

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right) = 0.070 - 0.011 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 300

$$\frac{\text{Chl a } 0.06 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 135
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 10 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.016}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.014}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 645}}$$

$$\frac{0.014}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.004}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.004}{\text{OD 630 (cor.)}} \right) = 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 136
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 20 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.019}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 663}}$$

$$\frac{0.018}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{0.004}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.004}{\text{OD 630 (cor.)}} \right) = < 0.058$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 137
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 20 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulsen

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.018}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 663}} \\ \frac{0.018}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 645}} \\ \frac{0.016}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} & = & \frac{0.001}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 138
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulsen

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.009}{\text{OD 663}} - \frac{0.006}{\text{OD 750}} & = & \frac{0.003}{\text{Corrected OD 663}} \\ \frac{0.006}{\text{OD 645}} - \frac{0.006}{\text{OD 750}} & = & \frac{0.0}{\text{Corrected OD 645}} \\ \frac{0.008}{\text{OD 630}} - \frac{0.006}{\text{OD 750}} & = & \frac{0.002}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 139
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: 40 m

A. Optical densities (1 cm cell)

$$\frac{0.012}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 663}}$$

$$\frac{0.010}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.008}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a} < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 140
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: 60 m

A. Optical densities (1cm cell)

$$\frac{0.015}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.013}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

$$\frac{0.013}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 141
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 60 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.019}{\text{OD 663}} - \frac{0.014}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.016}{\text{OD 645}} - \frac{0.014}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.016}{\text{OD 630}} - \frac{0.014}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 290

$$\frac{\text{Chl a } 0.058 \times 50 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 142
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-82
 Date Absorbance Read: 6-10-82
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.015}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.018}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.018}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 143
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth: 80 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

$$\begin{array}{rcl} \frac{0.017}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.007}{\text{corrected OD 663}} \\ \frac{0.013}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.003}{\text{corrected OD 645}} \\ \frac{0.012}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.081$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 405

$$\frac{\text{Chl a } 0.081 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 144
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
Depth: 100 m
 A. Optical densities (1cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulina

$$\begin{array}{rcl} \frac{0.032}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.012}{\text{Corrected OD 663}} \\ \frac{0.025}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \\ \frac{0.025}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.005}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.130

$$11.64 \left(\frac{0.012}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right) = 0.130$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 650

$$\frac{\text{Chl a } 0.130 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 145
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

A. Optical densities (1 cm cell)

$$\frac{0.022}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} = \frac{0.013}{\text{corrected OD 663}}$$

$$\frac{0.015}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.138

$$11.64 \left(\frac{0.013}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.138$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.138 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 146
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulina

A. Optical densities (1cm cell)

$$\frac{0.024}{\text{OD 663}} - \frac{0.013}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 663}}$$

$$\frac{0.019}{\text{OD 645}} - \frac{0.013}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

$$\frac{0.017}{\text{OD 630}} - \frac{0.013}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.115

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.004}{\text{OD 630 (cor.)}} \right) = 0.115$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.115 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 147
 Date Sampled: 9-1-83
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.035}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.015}{\text{corrected OD 663}} \\ \frac{0.029}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.009}{\text{corrected OD 645}} \\ \frac{0.026}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} & = & \frac{0.006}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.157

$$11.64 \left(\frac{0.015}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.009}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right) = 0.175 - 0.019 + 0.001 = 0.157$$

C. Chlorophyll a, ug/m³

1785

$$\text{Chl a } 0.157 \times 5 \text{ extract volume, ml} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

Volume of sample, m³ 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 148
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m
 A. Optical densities (1cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.083}{\text{OD 663}} - \frac{0.062}{\text{OD 750}} & = & \frac{0.021}{\text{Corrected OD 663}} \\ \frac{0.084}{\text{OD 645}} - \frac{0.062}{\text{OD 750}} & = & \frac{0.022}{\text{Corrected OD 645}} \\ \frac{0.086}{\text{OD 630}} - \frac{0.062}{\text{OD 750}} & = & \frac{0.024}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.198

$$11.64 \left(\frac{0.021}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.022}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.024}{\text{OD 630 (cor.)}} \right) = 0.244 - 0.048 + 0.002 = 0.198$$

C. Chlorophyll a, ug/m³

990

$$\text{Chl a } 0.198 \times 5 \text{ extract volume, ml} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ L}$$

Volume of sample, m³ 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 149
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 140 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.044}{\text{OD 663}} - \frac{0.034}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 663}} \\ \frac{0.044}{\text{OD 645}} - \frac{0.034}{\text{OD 750}} & = & \frac{0.010}{\text{corrected OD 645}} \\ \frac{0.042}{\text{OD 630}} - \frac{0.034}{\text{OD 750}} & = & \frac{0.008}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.095

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{0.010}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)}{0.001}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 475

$$\frac{\text{Chl a } 0.095 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 150
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m
 A. Optical densities (1cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\begin{array}{rcl} \frac{0.016}{\text{OD 663}} - \frac{0.012}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 663}} \\ \frac{0.015}{\text{OD 645}} - \frac{0.012}{\text{OD 750}} & = & \frac{0.003}{\text{Corrected OD 645}} \\ \frac{0.015}{\text{OD 630}} - \frac{0.012}{\text{OD 750}} & = & \frac{0.003}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - \frac{216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)}{0.001}$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.007} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 151
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.012}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 663}}$$

$$\frac{0.004}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 645}}$$

$$\frac{0.009}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{0.004}{\text{OD 663 (cor.)}} \right) + 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 276

$$\text{Chl a } \frac{0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 152
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 180 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

$$\frac{0.021}{\text{OD 663}} - \frac{0.013}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 663}}$$

$$\frac{0.021}{\text{OD 645}} - \frac{0.013}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

$$\frac{0.019}{\text{OD 630}} - \frac{0.013}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.077

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) + 216 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 366

$$\text{Chl a } \frac{0.077 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 153
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 180 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.031}{\text{OD 663}} - \frac{0.024}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.031}{\text{OD 645}} - \frac{0.024}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.031}{\text{OD 630}} - \frac{0.024}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.067

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.007}{\text{OD 630 (cor.)}} \right)$$

$$0.081 - 0.015 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.067 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000}$$

335 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 154
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.036}{\text{OD 663}} - \frac{0.026}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 663}}$$

$$\frac{0.037}{\text{OD 645}} - \frac{0.026}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

$$\frac{0.041}{\text{OD 630}} - \frac{0.026}{\text{OD 750}} = \frac{0.015}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.094

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.015}{\text{OD 630 (cor.)}} \right)$$

$$0.116 - 0.024 + 0.002$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.094 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000}$$

423 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 155
 Date Sampled: 9-1-82
 Station Sampled: 13
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 20 m
 A. Optical densities (1 cm cell)

$$\frac{0.029}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.009}{\text{corrected OD 663}}$$

$$\frac{0.028}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 645}}$$

$$\frac{0.031}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.011}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.089

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 2.6 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.011}{\text{OD 630 (cor.)}} \right) = 0.105$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.089 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 156
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: Surface
 A. Optical densities (1 cm cell)

$$\frac{0.017}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 663}}$$

$$\frac{0.013}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.014}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 2.6 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.003}{\text{OD 630 (cor.)}} \right) = 0.070$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.070 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 157
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-8-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: Surface

A. Optical densities (1 cm cell)

$$\frac{0.018}{\text{OD 663}} - \frac{0.012}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 663}}$$

$$\frac{0.016}{\text{OD 645}} - \frac{0.012}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 645}}$$

$$\frac{0.014}{\text{OD 630}} - \frac{0.012}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.004}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 350

$$\frac{\text{Chl a } 0.070 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 158
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

Depth: 10 m

A. Optical densities (1cm cell)

$$\frac{0.022}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} = \frac{0.007}{\text{Corrected OD 663}}$$

$$\frac{0.022}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} = \frac{0.007}{\text{Corrected OD 645}}$$

$$\frac{0.023}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.067

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right) - 0.015 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 302

$$\frac{\text{Chl a } 0.067 \times 4.5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.004} \text{ m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 159
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 10 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.020}{\text{OD 663}} - \frac{0.016}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 663}}$$

$$\frac{0.018}{\text{OD 645}} - \frac{0.016}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.016}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } <0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 160
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 20 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.024}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 663}}$$

$$\frac{0.024}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 645}}$$

$$\frac{0.024}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 247

$$\frac{\text{Chl a } <0.058 \times 4.25 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 161
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 20 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.007}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 663}}$$

$$\frac{0.005}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} = \frac{0.0}{\text{corrected OD 645}}$$

$$\frac{0.003}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} = \frac{-}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 218

$$\text{Chl a} = \frac{0.058 \times 3.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 162
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-18-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.014}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 663}}$$

$$\frac{0.013}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.013}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\text{Chl a} = \frac{0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 163
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 40 m
 A. Optical densities (1 cm cell)

$$\frac{0.017}{\text{OD 663}} - \frac{0.013}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 663}}$$

$$\frac{0.015}{\text{OD 645}} - \frac{0.013}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.015}{\text{OD 630}} - \frac{0.013}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ < 290

$$\frac{\text{Chl a } < 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 164
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

Depth: 60 m
 A. Optical densities (1 cm cell)

$$\frac{0.025}{\text{OD 663}} - \frac{0.016}{\text{OD 750}} = \frac{0.009}{\text{Corrected OD 663}}$$

$$\frac{0.023}{\text{OD 645}} - \frac{0.016}{\text{OD 750}} = \frac{0.007}{\text{Corrected OD 645}}$$

$$\frac{0.024}{\text{OD 630}} - \frac{0.016}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.091

$$11.64 \left(\frac{0.009}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 455

$$\frac{\text{Chl a } 0.091 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 165
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 60 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.021}{\text{OD 663}} - \frac{0.014}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 663}}$$

$$\frac{0.021}{\text{OD 645}} - \frac{0.014}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.020}{\text{OD 630}} - \frac{0.014}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.067

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.006}{\text{OD 630 (cor.)}} \right) = 0.081 - 0.015 + 0.001 = 0.067$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 335

$$\frac{\text{Chl a } 0.067 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 166
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.038}{\text{OD 663}} - \frac{0.021}{\text{OD 750}} = \frac{0.017}{\text{Corrected OD 663}}$$

$$\frac{0.034}{\text{OD 645}} - \frac{0.021}{\text{OD 750}} = \frac{0.013}{\text{Corrected OD 645}}$$

$$\frac{0.035}{\text{OD 630}} - \frac{0.021}{\text{OD 750}} = \frac{0.014}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.171

$$11.64 \left(\frac{0.017}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.013}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.014}{\text{OD 630 (cor.)}} \right) = 0.198 - 0.028 + 0.001 = 0.171$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 812

$$\frac{\text{Chl a } 0.171 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} = \frac{\text{m}^3 = \text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 167
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.029}{\text{OD 663}} - \frac{0.016}{\text{OD 750}} = \frac{0.013}{\text{corrected OD 663}}$$

$$\frac{0.024}{\text{OD 645}} - \frac{0.016}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 645}}$$

$$\frac{0.023}{\text{OD 630}} - \frac{0.016}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.135

$$11.64 \left(\frac{0.013}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.008}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.007}{\text{OD 630 (cor.)}} \right)$$

0.151 - 0.017 + 0.001

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.135 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 168
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.039}{\text{OD 663}} - \frac{0.021}{\text{OD 750}} = \frac{0.018}{\text{Corrected OD 663}}$$

$$\frac{0.032}{\text{OD 645}} - \frac{0.021}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

$$\frac{0.032}{\text{OD 630}} - \frac{0.021}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.187

$$11.64 \left(\frac{0.018}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.011}{\text{OD 630 (cor.)}} \right)$$

0.210 - 0.024 + 0.001

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.187 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 169
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth: 100 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.036}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.016}{\text{corrected OD 663}}$$

$$\frac{0.031}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.011}{\text{corrected OD 645}}$$

$$\frac{0.027}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.163

$$11.64 \left(\frac{0.016}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.007}{\text{OD 630 (cor.)}} \right)$$

$$0.186 - 0.024 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.163 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 170
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
Depth: 120 m
 A. Optical densities (1cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

$$\frac{0.032}{\text{OD 663}} - \frac{0.024}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 663}}$$

$$\frac{0.037}{\text{OD 645}} - \frac{0.026}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 645}}$$

$$\frac{0.036}{\text{OD 630}} - \frac{0.026}{\text{OD 750}} = \frac{0.010}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.047

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.011}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.010}{\text{OD 630 (cor.)}} \right)$$

$$0.070 - 0.024 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

$$\frac{\text{Chl a } 0.047 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 171
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.030}{\text{OD 663}} - \frac{0.020}{\text{OD 750}} = \frac{0.010}{\text{corrected OD 663}}$$

$$\frac{0.027}{\text{OD 645}} - \frac{0.020}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.024}{\text{OD 630}} - \frac{0.020}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.101

$$11.64 \left(\frac{0.010}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + \left(\frac{0.10}{\text{OD 630 (cor.)}} \right)$$

0.116 - 0.015

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.101 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1}{1000}$$

505 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 172
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 140 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.018}{\text{OD 663}} - \frac{0.013}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 663}}$$

$$\frac{0.019}{\text{OD 645}} - \frac{0.013}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

$$\frac{0.018}{\text{OD 630}} - \frac{0.013}{\text{OD 750}} = \frac{0.005}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.046

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.005}{\text{OD 630 (cor.)}} \right)$$

0.058 - 0.013 0.0005

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.046 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1}{1000}$$

230 0.001

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 173
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 140 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: J Pauline

A. Optical densities (1 cm cell)

$$\frac{0.021}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} = \frac{0.006}{\text{corrected OD 663}}$$

$$\frac{0.008}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 645}}$$

$$\frac{0.016}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.070

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 350

$$\frac{\text{Chl a } 0.070 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 174
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 160 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: J Pauline

A. Optical densities (1cm cell)

$$\frac{0.012}{\text{OD 663}} - \frac{0.008}{\text{OD 750}} = \frac{0.004}{\text{Corrected OD 663}}$$

$$\frac{0.011}{\text{OD 645}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

$$\frac{0.011}{\text{OD 630}} - \frac{0.008}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{0.004}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.003}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 290

$$\frac{\text{Chl } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 175
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 160 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.023}{\text{OD 663}} - \frac{0.015}{\text{OD 750}} = \frac{0.008}{\text{corrected OD 663}}$$

$$\frac{0.022}{\text{OD 645}} - \frac{0.015}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 645}}$$

$$\frac{0.022}{\text{OD 630}} - \frac{0.015}{\text{OD 750}} = \frac{0.007}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.079

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.007}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.007}{\text{OD 630 (cor.)}} \right)$$

$$0.093 - 0.015 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

415

$$\frac{\text{Chl a } 0.079 \times 5.25 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 176
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 180 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.028}{\text{OD 663}} - \frac{0.022}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 663}}$$

$$\frac{0.028}{\text{OD 645}} - \frac{0.022}{\text{OD 750}} = \frac{0.006}{\text{Corrected OD 645}}$$

$$\frac{0.030}{\text{OD 630}} - \frac{0.022}{\text{OD 750}} = \frac{0.008}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.006}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.006}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.008}{\text{OD 630 (cor.)}} \right)$$

$$0.070 - 0.013 + 0.001$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$

276

$$\frac{\text{Chl a } 0.058 \times 4.75 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered } 1 \text{ L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 177
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: (J. Paulin)

Depth: 180 m

A. Optical densities (1 cm cell)

$$\frac{0.016}{\text{OD 663}} - \frac{0.011}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 663}}$$

$$\frac{0.015}{\text{OD 645}} - \frac{0.011}{\text{OD 750}} = \frac{0.004}{\text{corrected OD 645}}$$

$$\frac{0.014}{\text{OD 630}} - \frac{0.011}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 6.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 276

$$\frac{\text{Chl a } 0.058 \times 4.7 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 2.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 178
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: (J. Paulin)

Depth: 200

A. Optical densities (1cm cell)

$$\frac{0.017}{\text{OD 663}} - \frac{0.014}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 663}}$$

$$\frac{0.017}{\text{OD 645}} - \frac{0.014}{\text{OD 750}} = \frac{0.003}{\text{Corrected OD 645}}$$

$$\frac{0.016}{\text{OD 630}} - \frac{0.014}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 2.16 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \text{ } 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ / L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 177
 Date Sampled: 9-1-82
 Station Sampled: 23
 Volume Sampled: 1 liter
 Depth: 200 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1 cm cell)

$$\frac{0.013}{\text{OD 663}} - \frac{0.010}{\text{OD 750}} = \frac{0.003}{\text{corrected OD 663}}$$

$$\frac{0.012}{\text{OD 645}} - \frac{0.010}{\text{OD 750}} = \frac{0.002}{\text{corrected OD 645}}$$

$$\frac{0.009}{\text{OD 630}} - \frac{0.010}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + \frac{0.010}{\left(\frac{\quad}{\text{OD 630 (cor.)}} \right)}$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl } a \times 0.058 \times \text{extract volume, ml}}{\text{Volume of sample, m}^3 \times 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 180
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: Surface

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y Paulin

A. Optical densities (1cm cell)

$$\frac{0.008}{\text{OD 663}} - \frac{0.006}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 663}}$$

$$\frac{0.007}{\text{OD 645}} - \frac{0.006}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

$$\frac{0.007}{\text{OD 630}} - \frac{0.006}{\text{OD 750}} = \frac{0.001}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) < 0.058

$$11.64 \left(\frac{\quad}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{\quad}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{\quad}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ < 290

$$\frac{\text{Chl } a \times 0.058 \times 5.0 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 \times 0.001} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 181
 Date Sampled: 9-2-82
 Station Sampled: 15
 Volume Sampled: 1 liter
 Depth: 40 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\begin{array}{rcl} \frac{0.009}{\text{OD 663}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.005}{\text{corrected OD 663}} \\ \frac{0.006}{\text{OD 645}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 645}} \\ \frac{0.006}{\text{OD 630}} - \frac{0.004}{\text{OD 750}} & = & \frac{0.002}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.005}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.007} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 182
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 80 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\begin{array}{rcl} \frac{0.013}{\text{OD 663}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.008}{\text{Corrected OD 663}} \\ \frac{0.007}{\text{OD 645}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.002}{\text{Corrected OD 645}} \\ \frac{0.006}{\text{OD 630}} - \frac{0.005}{\text{OD 750}} & = & \frac{0.001}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.093

$$11.64 \left(\frac{0.008}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, $\mu\text{g}/\text{m}^3$ 465

$$\frac{\text{Chl a } 0.093 \times 50 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} \quad \text{m}^3 = \frac{\text{sample volume filtered}}{1000} \quad \text{L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 183
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 100 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1 cm cell)

$$\frac{0.016}{\text{OD 663}} - \frac{0.004}{\text{OD 750}} = \frac{0.012}{\text{corrected OD 663}}$$

$$\frac{0.009}{\text{OD 645}} - \frac{0.004}{\text{OD 750}} = \frac{0.005}{\text{corrected OD 645}}$$

$$\frac{0.005}{\text{OD 630}} - \frac{0.004}{\text{OD 750}} = \frac{0.001}{\text{corrected OD 630}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.129

$$11.64 \left(\frac{0.012}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.005}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.001}{\text{OD 630 (cor.)}} \right) = 0.129$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.129 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 184
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 120 m

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: Y. Paulin

A. Optical densities (1cm cell)

$$\frac{0.015}{\text{OD 663}} - \frac{0.004}{\text{OD 750}} = \frac{0.011}{\text{Corrected OD 663}}$$

$$\frac{0.006}{\text{OD 645}} - \frac{0.004}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

$$\frac{0.006}{\text{OD 630}} - \frac{0.004}{\text{OD 750}} = \frac{0.002}{\text{Corrected OD 645}}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.128

$$11.64 \left(\frac{0.011}{\text{OD 663 (cor.)}} \right) - 216 \left(\frac{0.002}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.002}{\text{OD 630 (cor.)}} \right) = 0.128$$

C. Chlorophyll a, ug/m³

$$\frac{\text{Chl a } 0.128 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3} = \frac{\text{m}^3 = \text{sample volume filtered} / \text{L}}{1000}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 185
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 160 m
 A. Optical densities (1 cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulin

$$\begin{array}{rcl} \frac{0.008}{\text{OD 663}} - \frac{0.001}{\text{OD 750}} & = & \frac{0.007}{\text{corrected OD 663}} \\ \frac{0.005}{\text{OD 645}} - \frac{0.001}{\text{OD 750}} & = & \frac{0.004}{\text{corrected OD 645}} \\ \frac{0.005}{\text{OD 630}} - \frac{0.001}{\text{OD 750}} & = & \frac{0.004}{\text{corrected OD 630}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.081

$$11.64 \left(\frac{0.007}{\text{OD 663 (cor.)}} \right) - \frac{0.081}{216} \left(\frac{0.004}{\text{OD 645 (cor.)}} \right) + \frac{0.10}{\left(\frac{0.004}{\text{OD 630 (cor.)}} \right)}$$

C. Chlorophyll a, ug/m³ 405

$$\frac{\text{Chl a } 0.081 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

DATA SHEET: Chlorophyll a, Spectrophotometric Analyses

Sample No. 186
 Date Sampled: 9-2-82
 Station Sampled: 13
 Volume Sampled: 1 liter
 Depth: 200 m
 A. Optical densities (1cm cell)

Date Extract Started: 6-9-83
 Date Absorbance Read: 6-10-83
 Filter Size (micron): 0.45
 Personnel: G. Paulin

$$\begin{array}{rcl} \frac{0.013}{\text{OD 663}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 663}} \\ \frac{0.012}{\text{OD 645}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.003}{\text{Corrected OD 645}} \\ \frac{0.013}{\text{OD 630}} - \frac{0.009}{\text{OD 750}} & = & \frac{0.004}{\text{Corrected OD 645}} \end{array}$$

B. Equations: Chlorophyll a mg/l (corrected OD's) 0.058

$$11.64 \left(\frac{0.004}{\text{OD 663 (cor.)}} \right) - \frac{0.058}{216} \left(\frac{0.003}{\text{OD 645 (cor.)}} \right) + 0.10 \left(\frac{0.004}{\text{OD 630 (cor.)}} \right)$$

C. Chlorophyll a, ug/m³ 290

$$\frac{\text{Chl a } 0.058 \times 5 \text{ extract volume, ml}}{\text{Volume of sample, m}^3 0.001} \text{ m}^3 = \frac{\text{sample volume filtered}}{1000} \text{ L}$$

APPENDIX V

PEER REVIEW MEETING

REVIEW MEETING
FOR
CRATER LAKE WATER QUALITY MONITORING PROGRAM

AGENDA
February 16, 1983

| | | |
|-------------|----------------------------|--------------|
| 9:00-9:10 | Introduction | Rouse/Forbes |
| 9:10-9:30 | Background on Park Program | Forbes |
| 9:30-10:00 | Research Background | D. Larson |
| 10:00-12:00 | Peer Group Review | D. Larson |
| 12-1:00 | Lunch | |
| 1:00- | Review Continued | D. Larson |

OBJECTIVES

- * Briefly summarize past research work on Crater Lake.
- * Examine available data for possible statistical analysis beyond that applied to date.
- * Evaluate the general research/monitoring program for its responsiveness to management needs.
- * Evaluate field and laboratory methods and techniques for scientific validity, efficiency and effectiveness.
- * Identify critical information gaps in the current baseline data gathering and monitoring program.
- * Where appropriate, identify specific research projects showing most promise for understanding cause and effect relationships-knowledge of which is necessary for informed park management decision making.

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The Review Meeting for the Crater Lake Water Quality Monitoring Program was opened by Jim Rouse, park superintendent, and Mark Forbes, park resources management specialist. Importance of the lake as a national park, a history of the development of the clarity problem and the difficulties of working on Crater Lake were briefly discussed.

Doug Larson reviewed the limnological work done on Crater Lake and concluded with his own report on the park program which was started in 1982.

The meeting was then opened for discussion. Comments made have been summarized under the following topics:

1. Additional Research
2. Atmospheric Deposition
3. Buoy
4. Chlorophyll and Phytoplankton
5. Data Storage
6. Equipment
7. Nutrients
8. Organic/Inorganic Material
9. Periphyton
10. Sampling Procedures
11. Sewage
12. Tahoe Project
13. Winter Sampling

1. ADDITIONAL RESEARCH

- NPS funding is competitive process.
- park can provide some logistic support for private researchers.
- Stan Loeb volunteered weighed filters for "quick and dirty" estimate of biological vs. nonbiological ratio.
- Cliff Dahm volunteered nutrient analysis of 200 samples from one station during summer season of 1983.
- Ron Zaneveld volunteered to make some optical measurements.
- Ron Zaneveld volunteered determination of inorganic component.
- Cliff Dahm will analyze some snow samples from the park for nutrients.
- Rich Axler will encourage Castle/Tahoe graduate students to perform enrichment studies on water from Crater Lake.

2. ATMOSPHERIC DEPOSITION

- atmospheric deposition can be very important to lake nutrient budget and can be a source of trace metals.
- dry deposition may be more important for nitrate in the western United States than wet deposition.
- lake too alkaline to have pH affected by acid precipitation.
- should monitor atmospheric deposition.
- more meteorological data may also be needed.
- little acid precipitation data available on alpine lakes, more work needed.
- workshop on acid precipitation in northwest lakes would be helpful.

3. BUOY

- installation of permanent buoy at sample site appeared to be preferred method for finding and holding position.
- small buoy with radiotransmitter.
- triangulate technology and small float.
- major buoy under lake surface and "beer can" size float on surface.
- may be difficult to stabilize buoy in such a deep lake.
- Doug Larson, Ed Starkey, and Mark Forbes will work on buoy project.

4. CHLOROPHYLL and PHYTOPLANKTON

- should explore possibility of doing chlorophyll at park.
- important to stay with same analyzer.
- local person should do samples.
- phytoplankton samples fixed in Lugol's lasts for years, last summer's samples should definitely be analyzed.
- discrete phytoplankton samples may be needed for research but perhaps composites are adequate for monitoring.
- composite phytoplankton samples from Secchi level to surface would provide more information for less money.
- analysis of discrete phytoplankton samples is labor intensive and Crater Lake may not have dramatic species shifts; composite samples would allow detection of long-term shift of phytoplankton species.
- phaeophytin probably not worth doing.
- variation in Secchi disc readings demonstrates that lake is not necessarily decreasing in clarity.
- should sample phytoplankton less frequently and chlorophyll more often.
- phytoplankton, optics and nutrients are the most important parameters to be monitored.

5. DATA STORAGE

- data presented in annual reports and will be stored in computer at Oregon State University.
- possibility of linking park to OSU computer so data can be routinely stored.

6. EQUIPMENT

- transmissometer, photometer, and fluorometer data also needed.
- Ron Zaneveld has 80 lb. instrument with both transmissometer and fluorometer.
- Ray Smith has remote control equipment for optic measurements but may be hard to get on boat because of weight.
- Ron Zaneveld has small portable transmissometer which might be made available for use in Crater Lake.
- Ron Zaneveld has portable Coulter counter which could be taken to the lake, data correlates well with suspended mass and organic component can be distinguished from inorganic.

--park does not have technical person to operate fluorometer, so chlorophyll sampling may be necessary until persons are trained.

--earlier photometer data taken with different instrument so data not comparable; Cliff Dahm will look for old photometer at OSU (and found it).

7. NUTRIENTS

--trace metals might be more important than nitrogen.

--nutrient work in Crater Lake may require lots of sampling.

--algae in oligotrophic lakes are very efficient in absorbing nutrients.

--phosphate usually abundant in volcanic areas.

--inorganics, nitrogen, phosphate and total phosphate, silicate, and iron are needed.

--nutrient analysis needed.

--nutrient concentrations low so samples must be analyzed soon after collection.

--nutrient data very important.

--though Crater Lake is large and deep, it appears to be uniform enough to sample only one area for nutrients.

--baseline data on nitrogen at a number of depths is needed.

--water from Crater Lake was taken to Castle Lake; phosphate, nitrate, iron and trace metals were added to different bottles; most sensitive to nitrogen and trace element additions.

--may be lots of nitrogen in hypolimnion but if mixing is inadequate, it can still be limiting factor.

8. ORGANIC/INORGANIC MATERIAL

--suspended material in upper layer is probably mostly phytoplankton and that causes Secchi to decrease.

--gradual decrease in Secchi reading with peak in August supports phytoplankton being the causative agent and temperature a contributing factor.

--determination of suspended mass is needed because it determines extinction.

--suspended mass plus chlorophyll and phytoplankton needed to estimate percent inorganic material.

--ash-free dry weight perhaps easier method to get at inorganic component though diatom frustules may cause problems.

--management needs to know if it is a biological or nonbiological problem.

9. PERIPHYTON

--good indicator of point sources of nutrients.

--examine shoreline of whole lake once a year in August for attached algae, may be associated with human activities.

--should try to get earlier information on Cladophora near Wizard Island, for example, ask other investigators.

--Anabaena, a blue-green, earlier reported in Crater Lake - could have been confused with another species.

--nitrogen fixing blue greens not in open water in low nitrogen lakes, but may be in periphyton.

--should suspend glass slides to study periphyton growth.

10. SAMPLING PROCEDURES

--should alkalinity be done potentiometrically rather than colorimetrically?

--should sample at one station only.

--perhaps sample phytoplankton at only one site.

--perhaps alkalinity and DO once or twice a summer.

--pH taken at boat dock rather than in lab.

--2 liters or more filtered for spectrophotometric determination of chlorophyll unless a fluorometric procedure is used.

--Tahoe Research Group encouraged the collection of composite samples of the water column to 1) reduce sample numbers (\$) while maintaining effective monitoring, and 2) speed up data reduction.

11. SEWAGE

--liquid in and out of lagoons should be measured.

--dynamics of lagoons important to public relations.

--measure temperatures and calculate losses by evaporation to indicate amount of leakage.

--use of tracers to track direction of flow could be expensive and present technical difficulties.

--nitrogen will stay in solution while phosphate and iron will attach to soil particles.

- ground water can move very slowly.
- soils in Crater Lake are young and ground water may move faster.
- can use tracer and dig pits to determine direction of flow to overcome slow movement of ground water.
- any natural tracers like trace elements in effluent?
- use sodium chloride as tracer and measure conductivity.
- model movement of lagoon nutrients into Crater Lake.

12. TAHOE PROJECT

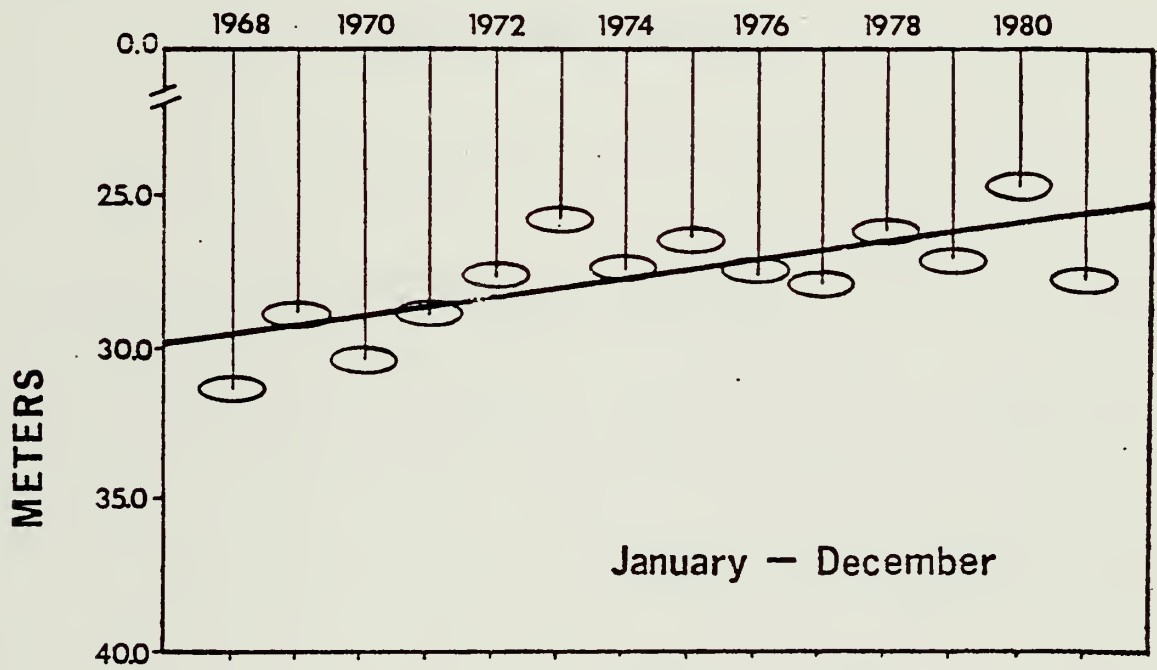
- uptake of C-14 is more dramatic but correlates well with Secchi, decrease in clarity due to algal growth and not abiotic particles (see attachment).
 - limiting factor narrowed down to nutrient, specifically nitrogen which appears to be the most limiting in recent volcanic regions of western United States.
 - due to recent influx of nitrogen, limiting factor may be switching from nitrogen to phosphorus.
- nutrient enrichment studies have been essential for delineating factors responsible for deteriorating water quality in Lake Tahoe.
- low percentage phaeophytin in Tahoe samples.
 - DO done only once a year because data not interesting.
 - amount of rainfall affects phytoplankton - less primary production during dry year - surface runoff is a major source of nitrogen.
 - data not available for distribution but most has been published.

13. WINTER SAMPLING

- logistics for winter sampling are complicated.
- need to get winter data early and then will know if it is necessary to go through the effort again.
- winter sampling will allow characterization of the nutrient budget for the lake and may help to determine depths of winter mixing.
- will sample every six weeks starting next winter.
- blooms from February on can strip nutrient supply.

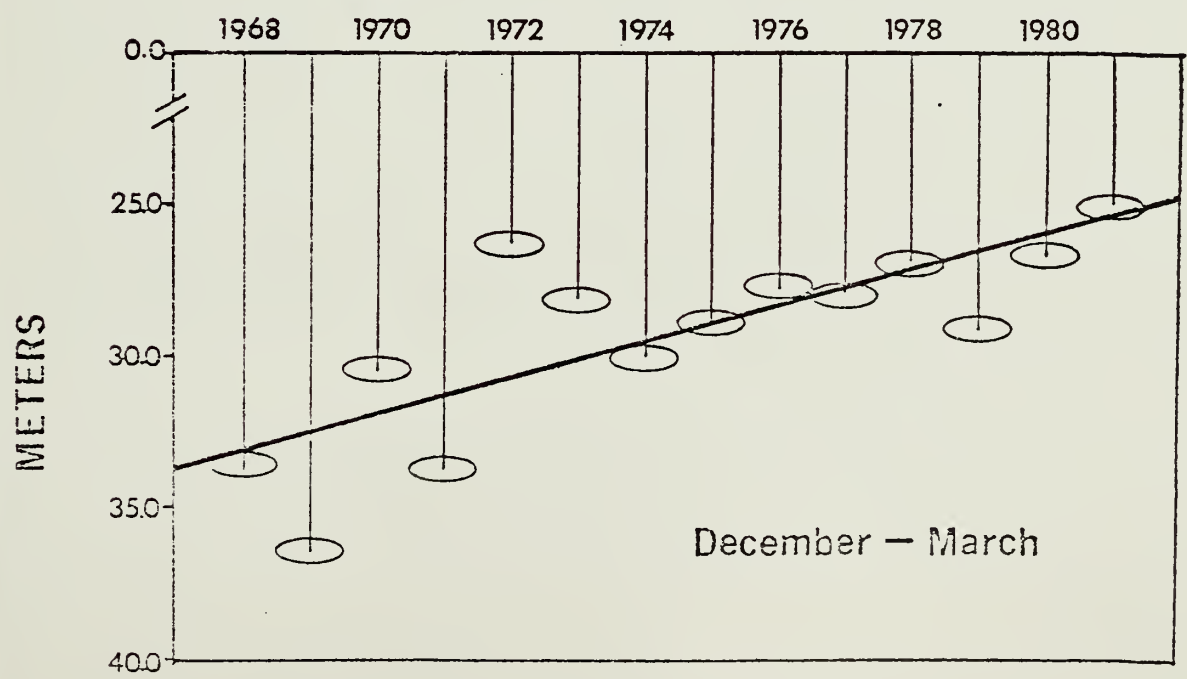
LAKE TAHOE

ANNUAL SECCHI DEPTHS



LAKE TAHOE

WINTER SECCHI DEPTHS



WRITTEN COMMENTS RECEIVED



United States Department of the Interior

NATIONAL PARK SERVICE
WATER RESOURCES LABORATORY
COLORADO STATE UNIVERSITY
FORT COLLINS, CO. 80523
(303) 491-7573

IN REPLY REFER TO:

L54 (499)

Memorandum

FEB 10 1983

To: Mark Forbes, Resource Management, CRLA
From: Raymond Herrmann, Chief, WRFSL
Subject: Annual Report on the Limnology and Water Quality Monitoring
Program at Crater Lake National Park, 1982

As requested, enclosed are some questions and comments from our staff on the Annual Report on the Limnology and Water Quality Monitoring Program at Crater Lake National Park, 1982. We hope they will be useful to your review.

Enclosure

P.S. I again apologize for not being able to make the peer review meeting. I hope the enclosed comments will help.

1. The sample sites should include the coves around Wizard Island. They should be at least looked at for productivity.
2. We are wondering about the effect of altitudinal changes from field to Lab on DO and pH measurements.
3. Regarding the plankton samples and ID, is it possible for them to make replicate samples. (Are they taking replicate samples?)
4. They should report secchi data according to sample status by date and time rather than just date.
5. The assistant to Mr. Gilmore as described may not be realistic.
6. The fluorometer sounds like a good idea. (page 36B).
7. Based only on the information presented in the report an analysis of comparable secchi disc data (i.e., 8" disc readings on clear calm days only, within one or two days of the same date between years) indicates that a decrease of approximately 25% transparency has occurred for the months of July and August since 1969 to the present (1982). No major secchi depth transparency changes are indicated prior to 1969.

These secchi depth readings also indicate a general pattern of minimum transparency during the last two weeks of August. This general pattern exists for both Station 13 and Station 23 for 1982.

An estimation of the "thermocline" ($1^{\circ}\text{C}/\text{m}$ decrease in temperature) for Stations 13 and 23 from data on Tables 3 and 4 indicates that the greatest depth of the thermocline is also around the last two weeks of August. This condition provides the greatest volume of water in the epilimnetic zone, thus the greatest volume of Crater Lake's optimal conditions of light, temperature, and available nutrients for increased algal biomass. Since the secchi depth transparency is decreased during the same approximate period, it strongly indicates, as Doug Larson suggests, that an increase in overall phytoplankton biomass is responsible for reduced transparency.

In order to gain more information between relationships of phytoplankton and transparency, two additions to the set of designed samples in the monitoring program would be valuable:

- 1) Dissolved oxygen values taken from the surface to 50 m in similar depth intervals as phytoplankton samples (i.e., add 10 m, 20 m, and 40 m DO samples). This would allow analysis of % DO saturation at levels above the thermocline. Presently, if % DO saturation is used as a tool for indications of phytoplankton activity, any increase or decrease at the surface could be attributed to temperature change, and as the secchi depth values show 50 m is presumably below the compensation point. Intermediate readings would provide a means of assessing possible photosynthetic estimations, activity of phytoplankton, mixing phenomenon, and temperature interactions.

- 2) An analysis of suspended particulate matter would be constructive. It seems this question is addressed with the proposed purchase of a transmissometer (page 30). It is valuable to determine if decreased secchi disc values are due to increased particulate load into the water column in combination with phytoplankton activity. Is it not possible that increased Park use, particularly late in August when a lot of people take vacations, and it usually is dry (?) could provide a source of increased particulate matter? This seems to be a potentially important management concern regarding input sources to Crater Lake, and visitor use.

8. Some confusion exists regarding the measurement of dissolved oxygen as presented in the report. On page 9 the "possible routine" schedule indicates collection of samples for chemical analysis, to be done on Tuesday (within 24-36 hours of sampling). It is not clear if DO measurements are completed in the field; fixed in the field with Hach chemicals then titrated with PAO later; or simply carried out for determinations later as raw water (invalid!). If at all possible, the DO determinations should be completed in the field as soon as possible after sample collection. If Hach chemicals are to be used, then why carry out many small bottles of fixed sample (must be at least "fixed" immediately after collection) that may leak, break, etc.

I would strongly suggest the purchase of an oxygen (DO) meter to measure the DO in mg/l immediately from collection. Not only would this save space in carrying several B.O.D. bottles, but the man-hours involved in titration methods could be put to better use. The approximate cost would be around \$400.00 which would include spare probe, probe membranes, and 50 ft probe cable. Calibration in the Lab would provide accuracy beyond titration methods since it is not an iodometric method based on the visual interpretation of the operator.

9. The numbered topics in the Discussion and Recommendations sections (pages 25-33) are all appropriate for the proposed objectives of the study and seem necessary.

The computer-based management system as outlined in the Appendix appears to be sound and usable.

The use of Landsat imagery may be valuable for sensing of the listed conditions on this topic (page 26) and should be attempted, but might not be a priority item in regards to information gained, due to the oligotrophic nature of Crater Lake. Winter limnology on Crater Lake would be ideal, not only specifically for this study and the outlined objectives, but for temperature zone limnology in general.

All aspects of the phytoplankton community listed on page 32 should indeed be recorded, including common statistical measures.

Ideally, one algologist should analyze all the samples, but if this is not possible it would be very important that the original algologist be a taxonomist with regionally relevant knowledge and possibly able to conduct culture studies if taxonomic variations due to temperature or nutrient conditions seem to appear.

The Crater Lake monitoring program appears to meet the designated objectives, provide basic essential limnological data which can be used as a tool to assess the conditions and changes within the Lake. The comments provided are suggestions designed to strengthen the study with minimal economic effects.

Department of
Fisheries and Wildlife



Corvallis, Oregon 97331-3803

(503) 754-4336

February 28, 1983

Dr. Doug Larson
Portland District Office
Corps of Engineers
P.O. Box 2946
Portland, OR 97208

Dear Doug:

I am sending you the two old articles on Crater Lake that I had xeroxed, your report with my comments, and a one page curriculum vitae. I also put together a graph and data set you might consider for inclusion in the report. It attempts to show the relationship between near surface temperatures and Secchi disk measurements.

I am glad to serve on the Crater Lake review committee and applaud your efforts to date to initiate a rigorous limnological survey of Crater Lake. The early results are encouraging and hopefully will provide the foundation for further, more intensive studies.

Sincerely,

A handwritten signature in cursive script that reads "Cliff Dahm".

Dr. Cliff Dahm
Research Associate

cja

Encl. (5)

COMMENTS BY DR. CLIFF DAHM, DEPARTMENT OF FISHERIES AND
WILDLIFE, OREGON STATE UNIVERSITY, CORVALLIS.

- (1) Section titled "Monitoring results for 1982", paragraph 1: "It looks as if September 1 and 2 had the highest temperature from 1-10 meters!".
- (2) Table 3, Temperature profiles at Station 13: "Are the values at the surface on July 12 and 29, and on 21 August correct?"
- (3) Section titled "Discussion and Recommendations", paragraph 5, article 2: "Any recommendations as to the type of research project?"
- (4) Section titled "Discussion and Recommendations", paragraph 10, article 5: "You may want to initially limit yourself to one winter sampling by helicopter, then reevaluate the need for further winter work".
- (5) Section titled "Discussion and Recommendations", paragraph 11, article 5: "It would be nice to get one sample before June, 1983".

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SANTA BARBARA • SANTA CRUZ

DIVISION OF ENVIRONMENTAL STUDIES

DAVIS, CALIFORNIA 95616

28 February 1983

Dr. Doug Larson
Army Corps of Engineers
Hydrology
P.O. Box 2946
Portland, Oregon 97208

Dear Doug,

Enclosed are our specific comments and recommendations for the Crater Lake Monitoring Program. We all felt that the meeting in Corvallis on 16 Feb. was very constructive and enjoyed seeing you again. It is regrettable that you did not have the opportunity to utilize the experience of the Tahoe Research Group sooner- but we are all happy to see you finally getting some financial support and systematically collected data.

We also strongly encourage you to consider allocating a modest amount of money to help support a nutrient enrichment study of Crater Lake phytoplankton during the coming summer (item #10). This time frame is particularly relevant because of the expertise, interest, and availability of Judith Lane. She conducted a preliminary experiment on Crater Lake phytoplankton in 1981 and has recently completed her Master's degree dissertation on similar types of experiments at Lake Tahoe and Castle Lake. Costs can be greatly reduced by incorporating these studies with some additional experiments she is planning to do at Castle this summer. We'll send a more detailed proposal under separate cover.

We've also enclosed some Tahoe/Castle reprints and reports which you might find useful.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard".

Richard Axler

A handwritten signature in cursive script, appearing to read "Stan".

Stanford Loeb

John Reuter

A handwritten signature in cursive script, appearing to read "John".
Tahoe/Castle Research Groups

Encls.

TO: Dr. Doug Larson
FROM: R.P.Axler, S.L.Loeb, J.E.Reuter
Tahoe/Castle Research Groups

DAVIS: DIVISION OF ENVIRONMENTAL STUDIES

25 February 1983

Recommended Sampling Program for Crater Lake

- 1) The biological, physical and chemical monitoring of Crater Lake should be conducted at a single "index" station. Concentrating the majority of the sampling at one station would reduce the amount of time required to be out on the lake, enable collection of a more complete and correlative data set, and facilitate a stronger interpretive analysis of the collected information. Synoptic collection at two or three other locations ~~once every month~~ ^{periodically} would provide information concerning the spatial heterogeneity of a few specific parameters (e.g. nutrient concentrations, chlorophyll a depth distribution, and Secchi depth).
- 2) Secchi depth readings should be continued throughout this ten year program. Measurements should be made at least once every week and, if possible, two people should make independent readings. Time of day, lake water surface conditions, and cloud cover should be standardized and recorded.
- 3) Water temperature depth profiles should be continued as during the summer 1982 at the one index station. Weekly profiles should be sufficient.
- 4) Dissolved oxygen, total alkalinity, specific conductance and pH analyses should be conducted twice during the summer (June-September), once during June or July and once during late August or early September (~~& once during winter~~).
- 5) Chlorophyll a (µg/liter) depth profiles should be conducted once a week or every two weeks. Filtration for this analysis should be done on the same day as collection. Fluorometry is recommended as an alternative to the more time consuming and costly acetone extraction method. The Turner Design flow-through instrument coupled with a pumping system would be an excellent choice, however, it is also quite costly. A Turner III Fluorometer would be adequate to characterize the depth-distribution profile of chlorophyll a using Van Dorn collected water samples for considerably less money. Calibration of the fluorometry with standards made from pure chlorophyll a extract is considered a necessity, ^{together with periodic lake water acetone-extract cross comparisons.}
- 6) Nutrient analysis of the entire water column is essential. Analyses should include: nitrate-nitrogen, ammonium-nitrogen, soluble phosphorus, total phosphorus and total iron. Analytical methods for these elements should have detection limits of 1 - 5 micrograms per liter (1-5 parts per billion).

Ammonium-nitrogen and soluble phosphorus are likely to be below these levels of detection in Crater Lake waters throughout the year, therefore, routine analyses for these forms should be reevaluated when more information becomes available. Sampling once a week or every two weeks for nutrient chemistry should be adequate. If a winter sampling trip is to be conducted, analysis of nutrient chemistry for the entire water column is strongly suggested since nitrate profile changes may provide an estimate of depth of mixing.

7. Trace element concentrations of water samples from a few depths in the lake should be conducted once a year. A single composite sample should be sufficient to characterize these elements, however, an initial comparison of a discrete-depth profile with a composite sample is recommended. Trace elements may be useful for characterizing suspected inflow of geothermal waters at the bottom of Crater Lake.
8. Phytoplankton species enumeration should be made on a composite water column sample (0-200 m). Discrete depth samples should be taken and stored for possible future needs which might require a more detailed analysis of the depth distribution of the phytoplankton community structure or an analysis of the community at a specific depth corresponding to a chlorophyll a (or fluorescence) maximum. Samples should be collected every two weeks or once a month. Our recommendation to use a composite sample and to reduce the frequency of this analysis is based on our experience that species enumeration is a very time consuming and costly procedure. Since discrete depth samples will be collected, this detailed information will not be lost. It might also be possible to reduce the sample volume if settling chambers are used for concentrating samples (125 ml is adequate for Lake Tahoe).
9. Attached algae (periphyton) is a very useful site-specific indicator of nutrient inputs from the watershed. At Crater Lake, Cladophora sp. (a green filamentous algae) has been observed growing attached to rock surfaces in the splash zone, for example, near Cleetwood Cove. A reconnaissance of the shoreline of Crater Lake to map the spatial distribution of this algae is recommended to identify locations where nutrient inflow may be occurring. This survey should be conducted once during the summer, the month of August being the most appropriate time. A time series colonization of algae on artificial substrates (e.g. glass microscope slides) can be used to quantify differences in water fertility (nutrient richness) and help identify sites where external nutrient inputs occur. Glass slides

should be positioned vertically in wooden racks at a depth of 1.0 m, removed monthly and analyzed for biomass accrual (e.g. ash-free dry weight per slide).

10. The decrease in transparency of the waters of Crater Lake, whether it has already occurred or will occur in the future, would most likely be the result of increased availability of nutrients. A series of biological nutrient assays designed to identify which nutrients (e.g. nitrogen, phosphorus, iron, etc.) the lake phytoplankton are most sensitive to (i.e. growth stimulated by) is strongly recommended, if not essential, in the beginning phase of this monitoring program. Two assay periods are suggested per summer; one in June and one in September. Nutrient stimulation biological assays should be repeated every year if possible or at least every 2 to 3 years over the ten year duration of this program.

The research group of Professor Charles R. Goldman at the University of California, Davis, is uniquely qualified to perform this type of assay based on more than twenty years of experience at Lake Tahoe and Castle Lake.

11. External inputs of nutrients to Crater Lake via precipitation should be examined. Optimally, analysis of the nutrient chemistry for each storm is suggested. Snow cores can be collected and melted from "snow board", the boards placed back on the snow surface after each storm. If this procedure is not practical a core of the entire snow pack at the end of the snow fall season (prior to runoff) could be analyzed for nutrient concentrations. These nutrient concentrations data could be adjusted using the total precipitation gauge already in the park to estimate total inputs. Dry atmospheric deposition is likely to be equally important but until better sampling techniques are developed, we would not recommend devoting monies to measure it. Dr. Wissmar's comments regarding consideration of the potential impacts of atmospheric acid and nutrient inputs were well taken. Collection of snow cores and analysis for plant nutrients will require minimum cost and effort and will be extremely valuable in future analyses of the Crater Lake ecosystem.

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SANTA BARBARA • SANTA CRUZ

INSTITUTE OF ECOLOGY - R.P.Axler

DAVIS, CALIFORNIA 95616

Dr. Doug Larson
Army Corps of Engineers
Portland, Oregon

4 March 1983

Dear Doug,

I've worked up the cost for a nutrient enrichment study of Crater Lake phytoplankton. The basic experimental design would include 8 triplicated treatments- probably split up as 4 in the epilimnion and 4 in the hypolimnion (perhaps N, P, NP, trace elements as the 4 treatments). Assays would run for 6 days with every-other-day sampling. C-14 PPr and fluorescence would be the basic parameters measured along with initial and final nutrient levels, chlorophyll-a, and cell density. A final report with data and interpretation would also be prepared for inclusion in your annual report. It's a lot of information which relates directly to the "cause-effect" aspect of the Crater Lake Monitoring Program. We all realize that your budget is tight. However, Judy Lane will probably be doing some similar work at Castle and Tahoe (on a part-time basis) and so we can keep costs low by including only full sampling days during the bioassays, even though she would undoubtedly be spending much more of her own time than has been budgeted. Basically, we are all interested in the Crater Lake ecosystem and these types of experiments can be fit into the overall framework of the current Castle/Tahoe nitrogen cycling program (C.R.Goldman, P.I.).

I think there are probably quite a few limnologists, oceanographers, and geochemists in the region who would be very interested in doing some work at Crater. Some encouragement might in turn be very helpful towards your goal of understanding this ecosystem and the changes which may be occurring.

BUDGET: Time: travel (Davis-Crater RT)2 d
field work (Crater)1 d
bioassay set-up (Castle Lake).....1 d
bioassay (days 2, 4, 6).....3 d
nutrient/chlorophyll analyses.....2 d
C-14 analysis.....1 d
data reduction.....2 d
Summary Report preparation.....3 d
15 days

Personnel cost..... 15 days (6% of annual) \$1350*

* based on University of California PGR III plus 29% fringe benefits

Travel: Davis-Crater Lake RT (ca 1000mi@ 18.5¢)....\$185

Supplies (filters, ¹⁴C, sample bottles, misc.).....\$150

TOTAL COST : ca.\$ 1685

J. Lane
S. Lock

Pick

1 of 2

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

26 April 83

Fisheries Research Institute, WH-10

Dear Doug:

I reviewed your report to the NPS and found it concise and more than adequate for its intended purpose. I have only two suggestions. (1) On page 14 you might talk in terms of layers within the water column, i.e., the layer extended or increased in thickness. (2) You might consider sampling some additional dissolved inorganic constituents several times a year (i.e., Sept. during low runoff; early winter before winter phyto-blooms; spring before ice-out; and summer ^{during and} immediately after ice-out and during initial "phyto-bloom".) Inorganic constituents might include SO_4 , Cl , and HCO_3 , other select anions, major and minor cations (see enclosed St. Helen's paper). Reason for SO_4 and Cl would be link to OK to have background data if soil and atmospheric studies are conducted. For example, changes

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SEATTLE, WASHINGTON 98195

Fisheries Research Institute, WH-10

in these dissolved constituents might be used as follows:

SO_4 - might reflect Δ in atmospheric inputs;

Cl - as a conservation constant may link to potential soil tracer studies.

Also, changes in above plus other constituents very useful in assessing changes in Natural Weathering Processes (i.e., Carbonation & oxidation) and man's influences (erosion to atmosphere pollution) that may enhance weathering. You might also include some measures of CO_2 .

Don, I think your report will be of great use to the WPS. If you need more feedback, please let me know.

17 May 1983

Douglas W. Larson
Hydrology Section
U.S. Army Corp. of Engineers
Portland, OR 97208



Dear Doug:

I have read your January 10, 1983 report and added a few comments. In general, I support the approach adopted and believe you are carrying it out efficiently.

I have also read through the summary of comments made at the February 16, 1983 meeting in Corvallis. The summary seems complete and accurate; it is clear you will not be able to include all the suggestions offered given your very limited budget. Some specific suggestions I would like to offer are:

1. In general, measurements should be duplicated. The replication of Secchi readings shows the value of repeated measures. Repeated measures of plankton and chemical constituents would also be valuable.
2. In contradiction to several comments in the summary of our February meeting, I believe the phytoplankton work should be continued, or even increased. As you know, shifts in the species of phytoplankton are sometimes especially clear indicators of changing ecological conditions. There is every reason to believe that any ecological changes in Crater Lake would be evident in changes in phytoplankton species long before there were any changes in chlorophyll concentration. In the hands of a skilled planktonologist, the analysis of plankton samples is very inexpensive when considered in light of the information received in return.
3. More attention should be given to the hydrography of the lake. The recent article by Williams and Herzen (1983) indicates that much of the limnological character of the lake is determined by the advection of water and heat into the bottom of the lake. In particular, the physical mixing and chemical composition of the lake water are very unusual. To understand the limnology of the lake, more good data on the influence of geothermal heat and water will be required. It would seem advisable that more attention be given to the temperature structure in the lake. Very precise temperature profiles at precise locations would be useful. (It is understandable that park managers are concerned about buoys on the lake. Perhaps the buoys would actually be an asset to public opinion if they serve to bring this study to public attention!)

Keep up the good work.

Sincerely,

Richard S. Petersen
Associate Professor of Biology

RP:mj

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Department of
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APPENDIX VI

Div. of Env. Studies, Univ. of California, Davis
Davis, California 95616

Born: November 9, 1948

EDUCATION

B.A., 1970. Physics. Temple University. Philadelphia, Pennsylvania.

Ph.D., 1979. Ecology. University of California, Davis, California.

EMPLOYMENT RECORD

Research Technician, Department of Physics, Temple University and Penn-Princeton Accelerator Facility, 1970-1974.

Fish-Checker, Institute of Ecology, Univ. of California, Davis (Castle Lake), 1975.

Research Assistant, Institute of Ecology, Univ. of California, Davis, 1976-1979. Castle Lake Limnology Program.

Teaching Assistant, Division of Environmental Studies, University of California, Davis, 1977. Introductory Limnology.

Teaching Fellow, Division of Environmental Studies, University of California, Davis, 1979. Instructor for Field and Laboratory Course in Limnology.

Post-Doctoral Research Limnologist, Institute of Ecology, University of California, Davis, 1980-present. Castle Lake Limnology Program.

Consulting Limnologist, Ecological Research Associates, 1978-present.

Co-Director, Lake Tahoe Interagency Monitoring Program, Institute of Ecology, U.C. Davis, April 1982-present.

PUBLISHED ARTICLES

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Axler, R.P., R.M. Gersberg and L.J. Paulson. 1978. Primary productivity in Big Soda Lake, Nevada. *Great Basin Nat.* 38:187-192.

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Gersberg, R.M., R.P. Axler and C.R. Goldman. 1980. Isotope tracer studies of nitrogen transformations in Castle Lake, California. *Proc. FAO/IAEA Symposium*, Vienna, Austria, August 1978.

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CURRICULUM VITAE

CLIFFORD N. DAHM, Research Associate

Department of Fisheries and Wildlife
Oregon State University
Corvallis OR 97331
(503) 754-4336

Education

B.S. Boise State College, Boise, ID Chemistry 1972
M.A. Oregon State University, Corvallis, OR Chemical Oceanography 1974
Ph.D. Oregon State University, Corvallis, OR Chemical Oceanography 1980

Professional Organizations

American Society of Limnology and Oceanography
Societas Internationalis Limnologiae
Ecological Society of America
American Society for Microbiology
American Geophysical Union
American Association for the Advancement of Science

Recent Publications

- Dahm, C.N., J.A. Baross, A.K. Ward, M.D. Lilley and J.R. Sedell. 1983.
Initial effects of the eruption of Mt. St. Helens on nitrogen cycle and
related chemical processes in Ryan Lake. Applied and Environmental
Microbiology (in press).
- Ward, A.K., J.A. Baross, C.N. Dahm, M.D. Lilley and J.R. Sedell. 1983.
Qualitative and quantitative observations on aquatic algal communities and
recolonization within the blast zone of Mt. St. Helens: 1980 and 1981.
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- Dahm, C.N., J.A. Baross, M.D. Lilley, A.K. Ward and J.R. Sedell. 1982. Lakes
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- Baross, J.A., C.N. Dahm, A.K. Ward, M.D. Lilley and J.R. Sedell. 1982. Initial
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- Dahm, C.N., S.V. Gregory and P.K. Park. 1981. Organic carbon transport in the
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- Dahm, C.N. 1981. Pathways and mechanisms for removal of dissolved organic
carbon from leachate in streams. Canad. J. Fish. Aquatic Sci. 38:68-76.

STANFORD L. LOEB

Div. of Env. Studies, Univ. of California, Davis
Davis, California 95616

Born: April 20, 1947

EDUCATION

B.A., 1969, Zoology, University of California, Santa Barbara
M.A., 1972, Biology, University of California, Santa Barbara
Ph.D., 1980, Ecology, University of California, Davis

EMPLOYMENT RECORD

Staff Research Associate, Lake Tahoe Research Group, Institute of Ecology,
University of California, Davis. 1973-1976.
Research Assistant, Institute of Ecology, University of California, Davis. 1976-1980.
Postdoctoral Research Limnologist, Institute of Ecology, University of California,
Davis, Lake Tahoe Research Program. 1980-1981.
Assistant Research Ecologist, Institute of Ecology, U.C. Davis. 1981-present.
Director, Littoral Zone Investigations, Lake Tahoe. Institute of Ecology,
U.C. Davis. 1981-present.

PUBLISHED ARTICLES

Loeb, S.L. 1972. Fine structure of the adrenal gland of Anas platyrhynchos under normal and experimental conditions. M.A. thesis, Univ. of Ca., Santa Barbara.
Cronshaw, J., W.N. Holmes and S.L. Loeb. 1974. Fine structure of the adrenal gland in the duck (Anas platyrhynchos). Anat. Rec. 180:385-406.
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HONORS, AWARDS AND MEMBERSHIPS

NDEA Title IV Fellowship (1970)
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Member--American Association for the Advancement of Science
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CRATER LAKE
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Education

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American Society of Limnology and Oceanography

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Community Service

City of Portland (Bureau of Water Works) Watershed Advisory Committee
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Publications

Petersen, R.R., 1975. Am. Naturalist, 109:35-99. "The paradox of the plankton: An equilibrium hypothesis"

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Published Articles:

Reuter, J.E., 1977. Seasonal distribution of phytoplankton biomass in a near-shore area of the Central Basin of Lake Erie in the vicinity of Ashtabula, Ohio. M.A. Thesis, State University College of New York, Buffalo. 79p.

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Professional Memberships

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Selected Publications

- Wissmar, R.C., J.E. Richey, and D.E. Spyridakis. 1977. The importance of allochthonous particulate carbon pathways in a subalpine lake. J. Fish. Res. Board Can. 34:1410-1418.
- Wissmar, R.C., and R.G. Wetzel. 1978. Analysis of five North American lake ecosystems. VI. Consumer community structure and production. Verh. Int. Ver. Limnol. 20:587-597.
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